Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone and Sound Waves

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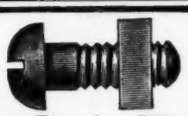

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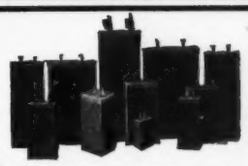

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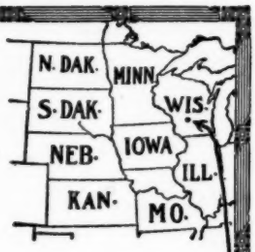
Of Dry Cells
Are Handled In This Territory



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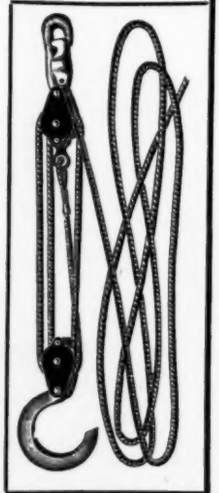

It is a light set of steel blocks. On one end there is an anchor hook to hitch unto cross arm or pin, on the other end is a spring snap hook to engage the eye of the grip. Note the locking hook on the upper block. By pulling the loose end of the rope under the hook the load is held then and there. All metal parts are galvanized. This tackle is quickly adjusted and as quickly removed. Order now for prompt action in time of need.

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WALL STREET ON BUSINESS CONDITIONS

Midsummer's lull is felt less than usual because business expands in response to spreading confidence, which is inspired by more attention to crops and less to politics. The advancing crop season brings no impairment of unprecedented prospects in garden, orchard and field. Labor is trebly blessed with wage advances this year to a new high level, full employment and declining cost of food. Any conceivable development in politics is a secondary concern. Nature has done her best for this country's agriculture this season to date and there is not much to fear in any ordinary course of climatic events.

It is no wonder that business holds steadier than ever before in a presidential election year, that tariff more than holds its own in volume, with unusual diversification of loadings, that steel orders continue to exceed shipments averaging 100 per cent. of mill capacity, allowing for scarcity of labor and steel; that dry goods, clothing, hardware, groceries, shoes and other staples of merchandise show forward and upward tendency, with some exceptions; that merchants and consumers in general evince increasing disposition to replenish their depleted shelves; that bank clearings show increases on top of last summer's increases; that borrowing demand at banks is spreading with commercial money firmly held at 4½ per cent. minimum and some 5 per cent. paper offered, and that collections generally are at least fair.—Wall Street Journal.

The Apportionment of Rates.

We have frequently expressed the belief that TELEPHONY should afford a hearing to both sides of many propositions affecting the telephone industry. In this issue is presented the views of a writer who maintains that, in determining rates, a telephone system should be considered as a whole and not as separate exchange units.

The printing of this article does not in the least indicate that TELEPHONY endorses the writer's opinion. We shall be glad to hear from the field on this subject. Authorities differ on the point here raised. Some hold that the exchange unit of values and earnings should constitute the basis for the regulation of exchange rates; that local conditions should not govern local rates.

The question is a broad and an important one. We hope that, among our readers, there are those who have definite and fixed beliefs regarding this matter and that they will not be backward in expressing them. TELEPHONY's columns are open for the fullest possible discussion. Take advantage of this condition and give a reason for the faith which may be in you.

The Stromberg-Carlson Situation.

Instead of the complete and final liquidation of the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., which rumor had foreshadowed, it develops that there is planned the organization of another, although a somewhat smaller, company to carry on the business. Viewed in this light, the move is merely one of a curtailment of expense; not by any means an abandonment of the field. The complete details of the proposed transaction, together with a statement of the company's position, are set forth elsewhere in this issue.

The general business outlook is now particularly bright. Prosperity characterizes every branch of industry, crops are exceptionally fine, money is easy. In the Independent telephone field we are facing an era of good times. A large amount of new construction, increased demands for service, ready absorption of new securities all indicate an extended period of successful and profitable operation. So far as general conditions go, therefore, they offer no justification for the liquidation of a manufacturing property as well known, as successfully conducted and as financially sound as the Stromberg-Carlson company.

We must, therefore, look elsewhere for the reasons for this curtailment. The disastrous failure some years ago of the United States Independent Telephone Co., of Rochester, was undoubtedly one of the main contributing causes. A number of the Stromberg-Carlson stockholders were

hit more or less severely in that crash, which did so much to render telephone, as an investment, unpopular in that city. Since that failure their interest in the business has perceptibly decreased. They have been, for some time past, willing to withdraw from it entirely. And this despite the fact that the manufacturing company was a conspicuous success.

Fortunately, there are other elements among the security holders who are confident that the business may be carried on to advantage, and these are to put the reorganization through. When those who wish to withdraw have done so the business will be again placed upon a stable foundation. That the company will rapidly regain any ground which it may have lost is not to be questioned. None of its present customers will suffer through the process, which is purely a financial one and which will necessarily be gradual, extending over a number of years.

Boost Your Long Distance Business.

A subscriber's station, on a rental basis only, produces a definite gross earning. This same telephone is capable of producing much greater earnings provided it is used for toll or long distance calls. The subscriber's telephone would be far more valuable to him as well as to the company, if his tolls amounted to as much as, even if no more than his rentals. Urge your subscribers to use the telephone for long distance calls. Show them the economy of it. Keep every man in the service bearing down on this point. You will be surprised at the results.

Here is a graphic way in which the Federal, of Buffalo, presents the case to its subscribers:

WHAT FEDERAL LONG DISTANCE TELEPHONE SERVICE WILL SAVE YOU IN TIME, DOLLARS AND CENTS.

Average distance from Buffalo to points within its wholesale and retail business district.....100 miles
Average time of trains in going this distance and return .....342 minutes
Time lost in finding party, visiting, and waiting for return train .....from 30 to 360 minutes
Railroad fare, at 2c per mile, 100 miles and return...$4.00
Total—A whole day.....Expense $4.00 to $6.00

VIA FEDERAL LONG DISTANCE

You can make a round trip of 10 to 250 miles in a very few minutes at a cost of from a few cents to a dollar, a direct saving of many hours and many dollars.

This is an argument that any business man can understand —and many of them act on it without further stimulus.

Telephone Manners.

There is probably no condition under which people so readily show their real character as in their use of the telephone and it is a safe assertion that their telephone manners are their real manners.

When your telephone rings, some one is knocking at your telephone door, which, by the way, is rapidly becoming the most important entrance to your home or office. How do you answer the call? By a gruff—"Who's there," a meaningless "Hello" or by a kindly greeting that gives the telephone caller the same advantage one has who makes a personal call, that of knowing where he is at.

The gruff—"Who's there," is the relic of the feudal days when good people feared to open the doors, lest the stranger prove to be an enemy come to demand the castle. The hello is a relic of other days when greetings were exchanged across distances, and it is natural that the habit is hard to drop, even when the telephone has eliminated distance. This is because we still feel the distance and think we must continue to bridge it with the distance greeting. But gradually we are coming to feel the intimacy which the telephone insures and our manners are becoming more natural, so that we do not act abnormal when a mere electrical speaking tube separates us.

The telephone has come to stay and each year we find new and broader uses for it. It therefore seems not unreasonable to expect that a code of telephone morals will be evolved which will make every one just as careful in his telephone greetings as in his observance of social customs, which just now is not quite the case.

If the average man would endeavor to gain entrance to a home or private office by the mode of procedure which he follows in making a telephone call, he would soon have occasion to order a better looking card of introduction or at least present it differently. The person who receives your card over telephone, cannot rub his finger across the surface to feel if it is engraved. But do not think for a moment that he does not look for the engraved manners of speech which, by the way, cost you nothing but a little oral embossing on a background of character that the printer cannot furnish you.

The Fate of the Man Who Stood Still.

There died a few days ago, at the age of nearly eighty, one of the most remarkable characters in the country. He was an old-time merchant in Aurora, Ill., and was known far and wide as the "man who stood still."

During the Civil War, says a daily paper, he owned the biggest and most profitable store in northern Illinois, outside of Chicago. When the soldiers came home business competition revived, but he was impatient with changes in styles and new-fangled fads and frills. He refused to advertise and kept the same goods on his shelves that he sold in the '50s. His business slumped rapidly. Five years after the war it was still paying him a profit, but in another ten years his store was nothing more than a curiosity shop. It was filled with such commodities as hoopskirts, jet jewelry and Paisley shawls.

The stiff-necked old merchant adhered to this policy up to the time of his death. He opened his store every morning at seven o'clock and remained there until six o'clock, waiting for customers who did not come. Behind its large, though weather-beaten front, there was silence always, except when a friend of the proprietor came in for a visit. It became known to the town as the "morgue." No arguments could induce him to get a stock of up-to-date goods and adopt modern selling and advertising methods.

The feeling aroused by the perverseness of this man was undoubtedly largely one of pity. Probably many regarded him as a little "off" mentally. No one besides himself defended his position. Yet his obstinacy is of value to the world, for he serves to point a moral.

Management and Care of a Modern 2000 Line Exchange

Outline of the Duties of and Rules for Operators—The Schedule—The Chief Operator—The Equipment—The Switchboard Man—The Power Plant and Its Care—Equipment for Charging the Storage Battery—The Care of the Battery—The Terminal Room

By P. Kerr Higgins

It is admitted by the majority of telephone engineers that the ideal telephone system is one in which the common battery is used, in other words, one in which power for signaling and talking is furnished from a battery located in the central office. It is more easily and economically maintained and the fluctuation of the power can be kept down to a minimum.

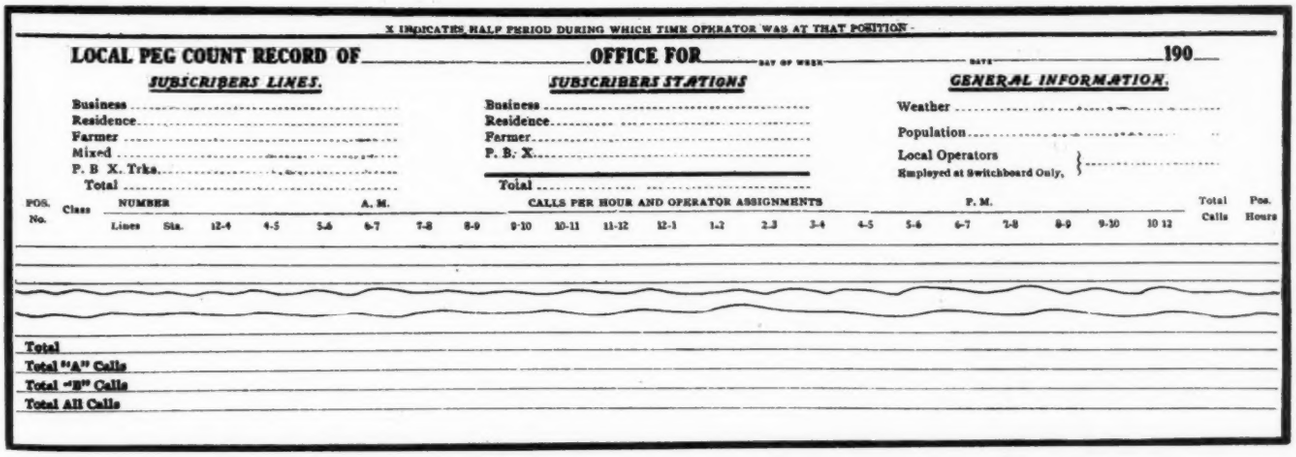
The highest and lowest talking efficiency attained in the local battery system is not quite reached in the common battery system, but the average for all subscribers is much greater in the latter.

No one will dispute the fact that a great measure of the success of a telephone plant lies in the management and handling of the central office; close attention and constant study on the part of those in charge is absolutely essential in order to maintain a uniform, quick and effective service.

It is assumed that the office has been equipped in a substantial manner, so that with proper care and attention, a good and efficient service can be given. This involves the necessity of a plant which requires from the operators, the least amount of labor and study, and so arranged as to reduce the possibility of mistakes to a minimum.

The plant under consideration is a medium sized one—say 2,000 subscribers—equipped with a switchboard, complete battery outfit, power, main and intermediate cross connecting boards, etc., the switchboard being divided off into sections of three positions each, each position having about 120 lines to be cared for by an operator. The care of the switchroom proper is placed in the hands of the chief operator, with an assistant if necessary. A special desk is provided for this chief and so furnished and arranged as to enable her to monitor all the positions and to keep all the necessary records, also information may be asked for by subscribers.

By careful study and a series of peg counts (see Fig. 1) the lines should be so arranged as to balance up, as nearly as possible, the work of the operators. A note of the numbers to be changed to other positions should be given the switchboard man to make the necessary cross-connections on the intermediate board provided for this purpose.


X INDICATES HALF PERIOD DURING WHICH TIME OPERATOR WAS AT THAT POSITION

LOCAL PEG COUNT RECORD OF _____ OFFICE FOR _____ DAY OF WEEK _____ DATE _____ 190__

SUBSCRIBERS LINES.

Business
Residence
Farmer
Mixed
P. B X. Trks.
Total

SUBSCRIBERS STATIONS

Business
Residence
Farmer
P. B. X.
Total

GENERAL INFORMATION.

Weather
Population
Local Operators Employed at Switchboard Only,

POS. No.	Class	NUMBER Lines	Sta.	A. M. 12-4	4-5	5-6	6-7	7-8	8-9	CALLS PER HOUR AND OPERATOR ASSIGNMENTS 9-10	10-11	11-12	12-1	P. M. 1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10 12	Total Calls	Pos. Hours

Total
Total "A" Calls
Total "B" Calls
Total All Calls

Fig. 1. Sample Form for Recording Results of Peg Counts, Useful in Distributing Work Among Operators.

THE OPERATION OF THE SWITCHBOARD.

It is difficult to lay down a set of rules by which operators may be governed, but the following may be taken as a basis, others being added to meet special cases:

1. All operators must report promptly to the chief at the hours designated and quietly take their places at the positions assigned them.
2. No unnecessary noise or talking will be permitted.
3. All calls must be answered promptly and supervisory (clearing out) signals watched closely, taking down the connections when the proper signal has been given. Operators must assist each other whenever possible and necessary.
4. Apparatus must be handled with care and in the prescribed manner. All connecting cords must be taken down by the plugs only.
5. Talk closely into the transmitter in a clear and natural tone.
6. Answer calls by "Number," and repeat the number given by the subscriber. In making connections, be very careful to get the proper line jack and see that it is not busy before completing the connection. Never break in on a connection, for by carefully watching the supervisory lamps or signals, one will know exactly how the connection stands.
7. Study the work and the subscribers in order that complaints may be avoided. Good manners and patience are absolutely necessary to success as an operator. Be polite.
8. Do not turn around when anyone enters the room, but pay strict attention to business.
9. When in doubt how to act, or when a subscriber complains or speaks in an improper manner, turn the call over to the chief operator.
10. When reporting for duty and when relieved, enter and leave operating room in a quiet and orderly manner, always placing the head receiver in its proper place. Always lock the locker and keep personal effects in same, not leaving them scattered about the room.
11. If a toll operator, use codes correctly and at all times.
12. Study the book of rules and be guided by them.
13. Give and take with the connecting points.
14. Endeavor to complete all calls.

In selecting operators, too much care cannot be taken and only those possessing the necessary qualifications should be

chosen. A good education, good manners, good eyesight and hearing, and a voice clear, strong, and of good timbre, are absolutely essential. The applicant should also have good health, be 5 ft. 4 in. in heighth, and have a one-arm reach of not less than 29 inches.

It is well in handling operators to relieve them from duty frequently, as this breaks the tension, is humane, and will prove a blessing in disguise. Operators' hours should never exceed eight hours' actual work. They are quick to appreciate justice and when well, firmly, yet kindly handled, will require very little disciplining, more especially if good selections have been made in the beginning. Never discipline an operator at the switchboard; take her to one side, otherwise a demoralizing influence is created and the operator humiliated sometimes when she is not to blame.

In the sitting room provided for operators there should be placed a telephone, where they can, when off duty or specially called, talk to their friends. The abuse of this privilege should be treated as a breach of trust. Good literature should also be provided. Tea or coffee in winter and iced lemonade in summer should be provided in the lunch room. These small attentions will be appreciated by the operators, keep them out of mischief and make them better satisfied. A special signal, from chief operator's desk to the rest room, should be installed for calling operators when their rest periods have expired.

Chief Operator.

The person holding the position of chief operator should have exceptional ability, large experience, and be thoroughly familiar with the operation of the apparatus. It is her duty to assign operators to positions at the board, make a record of same for future reference, and keep in close touch with them by means of the monitor, take care of all special calls turned over by the operators, assisting and helping the operators in every possible way with a view to greater efficiency, A book should be kept for recording all switchboard trouble, with headings as follows:

Date	Nature of trouble	Hour reported	Date and hour fixed	Trouble-man

This record should be neatly and faithfully kept. An operator's schedule as shown in Fig. 2 should also be provided.

Notices should not be allowed on the switchboard, each operator being provided with a small tablet, posted and corrected by the chief as often as necessary. These notices should be as few and as brief as possible and not contain information, such as changes, new subscribers, etc., this being the duty of the chief or special clerk.

It will further be the duty of the chief to see that the operating room is clean and well ventilated. Cloth bags, numbered, should be provided for the operators' talking sets, and the chief operator should see that they are put in their proper places.

The plant, during the day and night, will be under the constant care and attention of a switchboard man, experienced and qualified in every way to care for the same. Inexperienced help, no matter how small the salary, is always expensive and very unsatisfactory, the plant deteriorating very quickly if not cared for constantly by an experienced man.

The Day Switchboard Man.

He will care for all special trouble, and that which will not interfere unduly with the operation of the switchboard. He will also examine the equipment every day so that when inspected by the chief inspector, or foreman, at irregular intervals, everything will be found permanent and in good repair. No temporary work of any character should be tolerated. Especially does this apply to common battery systems. He will make all cross connections, keep records, and care for the power plant, etc.

All charging of batteries should be done, when possible, during the day, and records kept showing discharge readings every hour, also voltage before beginning charge and at end of charge. The object of charging during the day is that the machines instead of the battery, may carry the peak of the load. It is found to be more economical to charge the batteries in this manner.

The switchboard man should see that a small work bench and suitable drawers and lockers are provided for the necessary tools and material. Places having been provided, everything should be kept in its place in a clean, orderly and tidy manner.

The switchboard and all auxiliary apparatus must be kept free from dust and all repairs should be made promptly and the trouble record, Fig. 3, carefully filled out.

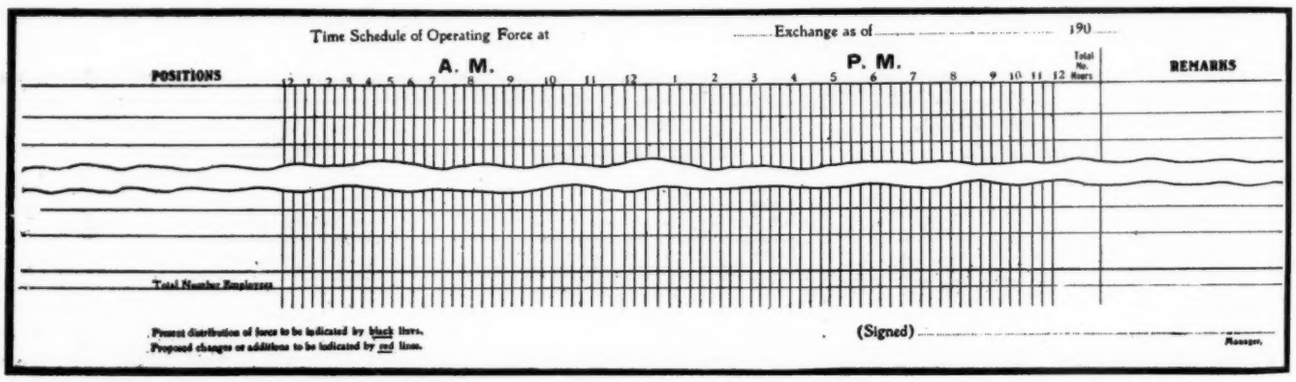

Time Schedule of Operating Force at
Exchange as of
190
POSITIONS
A. M.
P. M.
Total No. Hours
REMARKS
12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
Total Number Employees
Present distribution of force to be indicated by black lines.
Proposed changes or additions to be indicated by red lines.
(Signed)
Manager.

Fig. 2. An Operators' Schedule, Showing Distribution of Operators at Switchboard at All Times.

The switchboard man should be given assistance whenever necessary, but usually in an exchange of this size, which is in fair condition, one man will be found sufficient.

The Power Plant.

Power plants are seldom, if ever, used or necessary at local battery exchanges. When used they generally consist of a number of motor generators or switchboard dynamotors and a storage battery.

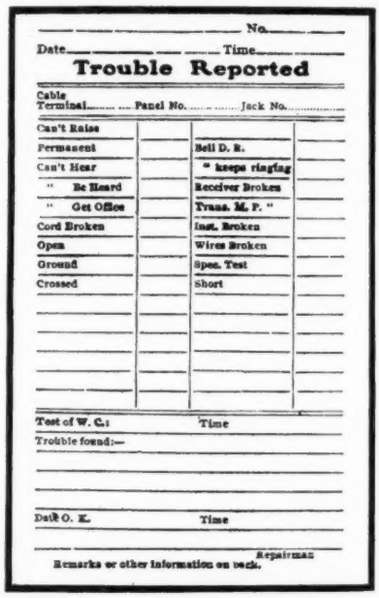
Motor generators are used for supplying alternating current for ringing the subscribers and direct current for charging the storage battery. It has been customary to install duplicate sets of motor generators or dynamotors, one set being used in case of accident to the other. This, however, can be obviated by supplying additional armatures for the machines as usually the trouble is experienced in this portion of the power plant.

On the power switchboard are mounted voltmeters, ammeters, rheostats, switches and the necessary fuses for protecting, regulating and controlling the current used by the plant. It is customary to furnish two ammeters, one for meas-

uring the battery charging current and another for measuring the discharging current. The voltmeter can be used to advantage for various purposes if suitable switching devices are supplied so that it can be connected to any desired circuit.

In regard to efficiency it has been found that dynamotors are more efficient machines than motor generator sets. In many plants, especially where only alternating current is available, mercury arc rectifiers which have a higher efficiency than either the dynamotor or motor generator, are now used.

The loss in the motor generator set is generally a sum equal to that of two machines having practically the same output



No.

Date Time

Trouble Reported

Cable Terminal Panel No. Jack No.

Can't Raise			
Permanent		Bell D. R.	
Can't Hear		" keeps ringing	
" Be Heard		Receiver Broken	
" Get Office		Trans. M. P. "	
Cord Broken		Inst. Broken	
Open		Wires Broken	
Ground		Spec. Test	
Crossed		Short	

Test of W. C.: Time

Trouble found:—

Date O. K. Time

Repairman

Remarks or other information on back.

Fig. 3. A Trouble Record.

as that of the motor generator. In the dynamotor, the conditions are materially improved by the neutralizing effect of the two armature windings, which in this case are mounted on the same core. Under these conditions, the voltage developed at the generator end depends directly on the voltage supplied to the motor end, hence the motor generator set possesses a decided advantage because of the fact that the two machines composing the set are entirely independent of each other, except that they both operate on the same shaft at the same speed.

The dynamotor has the advantage of being more compact, lighter in weight and much cheaper than the motor generator set. If, however, the current supply be of much higher voltage than that necessary to run the set, the distinguishing feature of the motor generator set is of decided advantage, as a higher degree of insulation between the motor and generator may be secured and repairs can be made much more easily.

Both types are usually shunt wound and are generally operated on constant potential circuits. The manner of starting these machines is similar to that used in ordinary shunt wound motors, but it is necessary to take great care to increase the current gradually through the motor armature circuit.

It is absolutely essential that all machines for the furnishing of current in telephone offices, be kept absolutely clean and well lubricated; that as little vibration as possible should take place, hence the necessity for firm foundations for all machines so as to reduce the vibration to a minimum. Great care should also be taken to see that no sparking at the brushes is allowed and under no circumstances should emery cloth be used, only sand paper. Sometimes it will be found that readjustment of the brushes will be sufficient to eliminate the sparking.

A few drops of machine oil or a little vaseline rubbed on the commutator with a cloth or by means of very fine sandpaper furnishes the best lubrication. Care should be taken against applying too much oil or vaseline or trouble will be experienced. Neither oil or dust should be allowed to accumulate on or near the machines and great care should be taken that in starting the machines the proper resistance is always cut in circuit.

The simplicity and reliability of the mercury arc rectifiers for producing direct current for charging storage batteries has been proven. Although its introduction is of comparatively recent date, the improvements in it have been very rapid. The rectifier is now not only simple and effective in operation but much more efficient than any apparatus formerly used for this purpose. Its object is primarily to rectify alternating current and in this way transform it into direct current. It is inexpensive, portable, reliable, takes up a minimum of floor space, and has a remarkably high efficiency at both full and light loads. It needs but little expert attention.

It is unnecessary to give an explanation as to the circuit, as one is furnished with the sets. By carefully studying the circuit and following instructions, the mercury arc rectifier will give very little trouble in telephone work. The part most likely to give out, is the rectifier tube and it is customary to have an extra one of these always in stock for emergencies.

A rectifier outfit consists usually of three essential parts, namely: the panel, the tube, the compensating reactance.

The panel is entirely self-contained, requiring only to be connected to the secondaries of the supply transformer and to the load. Completely equipped, it requires a floor space of approximately 16 in. by 18 in. and has a height of 64 in. On it is mounted a direct current voltmeter and ammeter, a double pole switch for connecting to the supply current, a direct current circuit breaker for the load, and the necessary switches, etc., for starting and operating.

A starting resistance is mounted on the back of the panel and is controlled by a single pole, double throw, spring switch. An auxiliary spring switch mechanically operated by the starting switch automatically opens the starting anode circuit as soon as the starting switch handle is released.

Accurate voltage control is obtained by a regulating reactance placed at the back of the panel and operated by a regulating switch on the panel. It is connected in series on the alternating current side of the rectifier and by its means a very fine adjustment of current and voltage may be obtained without extinguishing the rectifier arc in any way interrupting its operation.

The rectifier tube is supported on the back of the board by a holder consisting of a metal frame so pivoted and arranged at its center that it can be rocked back and forth in order to start the arc. This rocking movement is accomplished by means of a small handwheel on the front of the board, which is connected to the tube holder.

The compensating reactance which maintains the arc at each reversal of the alternating current, is connected directly across the supply mains. It is mounted in a cast iron case and stands on the floor beneath the panel. Leads are brought out from different portions of the coil to a double arm dial switch mounted on the front of the case. An approximate adjustment of the voltage and current within the limits of the rectifier may be accomplished by means of the dial switch, the finer adjustment being made by the regulating or controlling reactance on the panel.

A small electro-magnetic starting device may be placed on the mercury arc rectifier panels if desired. It is particularly useful where large fluctuations, or momentary interruptions, sufficient to stop the arc, are liable to occur in either the supply current or the load. This device rocks the tube and starts the arc automatically.

The rectifier as made for charging telephone batteries, electric vehicle batteries, operating arc lamps, motors, etc., is now furnished in four sizes, ranging in capacity from 10 amperes, to 40 amperes. They can be adapted to any commercial frequency, and the regular outfits will operate satisfactorily on any frequency from 25 to 140 cycles, inclusive. They are designed primarily for 60 cycles and the maximum direct-current voltage obtainable when operated at 25 cycles will be slightly higher, and when operated at 140 cycles considerably lower than when operated at 60 cycles.

The standard outfits are designed for operating on either 110, 220, or 330 volts alternating current, 60-cycle, single phase circuits. It has been found that for a direct current voltage range of 45 to 115, 220 volts alternating current will give the best results, while for a direct current range from 0 to 45 volts, 110 volts alternating current is most satisfactory. For practical purposes the direct current voltage may be considered to range from 20 per cent. minimum to 52 per cent. maximum of the alternating current, while the quantity of alternating current may be considered as ranging from 40 per cent. minimum to 66 per cent. maximum of the direct current delivered.

As the loss in the arc is constant, the efficiency, of course, varies with the direct current voltage delivered. Tests have shown the efficiency of a 30-ampere set, operating from a 220-volt, 60-cycle alternating current circuit, to be over 75 per cent. from one-quarter to full load at a direct current voltage averaging 80 volts, and over 80 per cent. for direct current averaging 111.2 volts. It will therefore, be noted that the efficiency is high down to one-quarter load. At the same delivered direct current voltage, practically the same efficiencies would hold on sets of other capacities.

Accumulators.

The fact that the storage battery or accumulator in the modern exchange plant is the foundation and center of the entire system and without it the system would be practically dead, necessitates the greatest possible care in maintaining it so as to obtain therefrom the maximum efficiency at the minimum cost and avoid in every way the possibility of a complete breakdown. It is advisable in many cases to install a duplicate set of storage cells for use in cases of emergency. Each set should have sufficient capacity to serve the plant 24 hours on a single charge.

In the care of accumulators (which should be located in a well ventilated cool room, well shaded) the troubles liable to occur are generally of a simple nature. If located in time they may usually be prevented by properly treating the affected parts. Of these troubles, sulphating of the plates is perhaps the most common and can be detected by the formation of a white deposit on the surfaces of the plates. It is caused by discharging the cell too rapidly or too slowly. The remedy consists in charging and discharging at a slow rate, never allowing the electromotive force of the cell to drop below 1.9 volts or its capacity to become less than one-quarter of the rated value. If the sulphating is very far advanced, it is well to scrape the plates with a stick of hard wood and then thoroughly wash them in battery solution.

Uniform and regular charging are absolutely essential to the longevity of the battery. The cells should be examined carefully every other day, using an electric lamp so that the bottoms may be seen.

A four or six candlepower incandescent lamp with a flat bulb is very useful for inspecting the cells for buckling or for short circuits of any kind. Frequent examinations of the battery solution should also be made with a hydrometer, as its specific gravity is liable to change on account of evaporation. On account of danger of injury to the plates, concentrated acid should never be added to the solution in a cell without first being diluted. In diluting acid, the acid should be poured into the water, not water into the acid, as in the latter case explosions of more or less violence are liable to occur.

Hydrometer and voltmeter tests must be taken frequently, and specific gravity not be allowed to go below 1,180, nor above 1,200. While 1.9 volts is given as a safe discharge rate, it is not safe to do this continually. When cells are installed, a certain economical discharge rate is given them as also a certain ampere hour capacity. This economical discharge rate should not be exceeded except on rare occasions, such as breakdowns, etc., otherwise sulphating and buckling of the plates is sure to set in, and, if not remedied, finally ends in the disintegration of the plates.

The usual make of plates allows a normal discharge rate of about .0165 ampere per square inch of surface of positive element and a discharge capacity of 4.5 ampere hours per pound of all elements, positive and negative. When a cell reaches 1.9 or thereabouts, the voltage falls very rapidly, and must be carefully watched when it is necessary to discharge beyond this point.

The efficiency of a cell or battery may be increased by charging and discharging to the same point at very slow rates, the efficiency being the quotient of the current taken out, divided by that supplied. The loss due to internal resistance is proportional to the square of the current flowing.

The jars of the cell should be slightly separated from each other, and each should rest on four insulators so as to afford ventilation for the prevention of moisture. The floor should be made of some material unaffected by sulphuric acid, and on account of the destructiveness of sulphuric acid fumes the battery room might well be apart from the other rooms in the exchange. The floor and the surroundings of the cells should be painted with asphaltum paint to prevent damage by spray.

In order that the battery attendant may protect his hands from the acid solution, it is advisable to dip them now and then in some water in which considerable washing soda has been dissolved; in case the acid gets upon his clothing "ammonia fortis" will prove very effective in neutralizing it.

Evaporation may be reduced by placing over each cell, properly insulated, a sheet of glass; this also helps to keep out dust, etc.

When fuses are designated they must always be placed in the proper location and of suitable capacity, no wire jumpers being allowed in any case.

Blisters on the plates should be carefully watched and gently pressed back into place by a flat piece of hard rubber or wood —never use metal.

Acid will seldom need to be added to the cells. When water is added, it should be done with a siphon pump so that it reaches the bottom of the cell. It is found to be more economical to use distilled water, as vegetable and sand deposits are thus avoided and the cell easily kept clean. The elements should always be well covered with electrolyte, whether in use or not, only the lugs or connecting rods being exposed. Cells must never be tampered with unnecessarily, and charging should be stopped whenever the cells commence to boil or spray. Any charging done after this is, as a rule, only waste of energy and of electrolyte, necessitating the addition of water.

When a cell is in good condition, the positive plate is of a chocolate brown or deep red color and the negative, steel gray. No particles must be allowed to fall or remain between the plates. A cell is fully charged when the gravity ceases to rise and the voltage while charging is 2.5 volts.

In connecting the battery for a charge, the cells are joined in series with each other and with the charging generator, the positive terminal of the battery being connected with the positive terminal of the generator and the negative side of the battery circuit with the negative terminal of the generator. An automatic switch is sometimes connected in circuit so that when the cells become charged and their voltage rises above

(*Continued on page 144.*)

Stromberg-Carlson to Dissolve—New Company to Form

Stockholders of Rochester, N. Y., Telephone Manufacturing Company Vote for Liquidation—Arrangements Being Perfected to Organize Another Corporation, Somewhat Smaller, to Carry on Business—Concern Out of Debt and Prosperous

At a meeting of the stockholders of the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., this week, it was decided to liquidate the corporation. It was also decided by some of the interests involved to organize a somewhat smaller company to succeed the present organization and to carry on the business without interruption.

The statement given out by Frank N. Kondolf, president of the company, at the close of the meeting, was as follows:

> The stockholders of the Stromberg-Carlson Telephone Manufacturing Co. met this forenoon. Over 23,000 shares were present or represented by proxies. All voted in favor of a resolution to liquidate the corporation. The directors of the company will, according to law, have charge of the liquidation.
>
> The directors will meet in a day or two and in all probability will declare a cash dividend of 38.58 per cent. of which 28.58 per cent. is to pay dividends in full on preferred stock and 10 per cent. is to go toward liquidating the par value of the preferred stock.
>
> The reason for this step is not that the company is in any financial difficulties. It owes no indebtedness of any sort and has a large amount of cash on hand. The sole reason is that it has too large a plant and too much capital invested for the volume of business to be obtained.
>
> Announcement was made in the meeting that a plan was being formulated looking to the organization of a new and smaller company to take over portions of the plant, machinery, merchandise, etc., and continue the business of the present company. Details of this plan will be announced as soon as they can be perfected.

Later a letter was issued to the company's customers, signed by J. G. Ihmsen, general manager, which makes clear the future plans for reorganization touched on in the foregoing. In sending this letter to TELEPHONY for publication the manager says:

"We are enclosing copy of communication being sent generally to our customers which fully explains the attitude of this company in regard to its reorganization. All danger of the company becoming eliminated is dispelled by this action, which seems to be very satisfactory to all concerned." The letter is as follows:

> In order that you may have direct and accurate information in regard to the affairs of this company, we desire to make the following statement.
>
> We have realized for some time that we had too large a plant and investment to carry on profitably the business which we have been doing, and therefore have been planning to liquidate a portion of our investment.
>
> Accordingly, at a meeting of stockholders, held today, it was decided to liquidate the present corporation. This action is taken, not because of any financial trouble, for we have no indebtedness of any sort, but for the reason above stated.
>
> It is proposed, and plans are already under way, to form a new corporation which will take over and continue the business of the old company, taking over also such portion of the plant, machinery, merchandise, etc., as can be advantageously utilized, such new corporation to be owned by substantially the same people and to be as well equipped to meet our customers' requirements promptly and efficiently as we have been in the past.
>
> In the meantime we are prepared to execute your orders furnishing the same high-class apparatus as heretofore.

The Stromberg-Carlson company was organized April 1, 1912, with a capitalization of $1,500,000 of common and $1,500,000 of preferred stock issued. On October 1, 1906, the regular dividend of 7 per cent. on the preferred stock was not paid, and from that time until last year no dividends were paid. Last year 12¼ per cent. of the accumulated dividends on the preferred stock was paid.

In March, 1911, the company sold its Chicago plant and used the $300,000 derived from the sale, together with the money realized from the collection of some accounts and notes and the conversion of some of the company's investments, to pay off the debts to the amount of $497,500. The total indebtedness of the company was paid on April 25, 1911.

The balance sheet, issued December 31, showed assets of $3,171,723.07. The statement on the liabilities shows $1,500,000 preferred stock, $4,500,000 common stock, less in treasury $3,000,000. Current accounts show $24,260.75 and the surplus of $147,462.32, making a total of $3,171,723.07.

The net income for 1911 is given as $81,323.35, with depreciation and renewals given at $64,360.86. The net earnings for the year 1911 are given as $16,962.49, which, less the interest on loans, makes $10,206.52 the net profits. The profit on Chicago property sold was $60,565.92, so that after the dividends for year there was a surplus of $147,462.32.

The officers and directors of the company are: President, Frank N. Kondolf; vice-president, George W. Todd; secretary and treasurer, W. Roy McCanne; Albrecht Vogt, J. Foster Warner, F. C. Goodwin, Henry Barnard, A. J. Katz and Jacob Gerling, Sr.

Rulings of Kansas Commission.

The Kansas Public Utilities Commission has denied the application of the Home Telephone & Electric Co., of Highland, asking for permission to raise its residence rate from seventy-five cents to $1, and its business rate from $1 to $1.50 per month.

The Potter Telephone Co. asked the right to raise its rural service rate from $1 to $1.25 per month. This the commission declined to grant for the present. It went further and found that lines of the company were not maintained in proper condition to give good service and ordered that they be put in good condition. The commission also ordered the company to cease giving a combination rate of $2.50 a month for one business and one residence telephone, the separate rates being $2 for business and $1 for residence, holding that the combination worked a discrimination against the subscriber having only residence service.

The commission authorized the Katy Telephone Co., of Elmore, to issue $5,000 first mortgage 8 per cent. bonds. Of the proceeds, $1,500 is to be applied to securing a permanent location, $2,000 for the retirement of a present bond issue, and $1,500 for betterments and extensions.

Would Promote Merger in Los Angeles.

The Telephone Reform Association has been organized in Los Angeles, Cal., for the avowed purpose of canvassing the sentiment in the city as to the advisability of combining the Home and the Pacific Bell companies there. The association has sent out 140,000 letters to the subscribers of both companies seeking an expression of opinion.

Fixing of Rates Based on Telephone System as a Whole

Argument Against Exchange Unit Basis of Valuation of Telephone Property in Determining What is a Fair Rate Schedule Advanced by Writer in Public Service, of Chicago—One Side of a Controversy of Vital Interest to All Operators

By H. O. Seymour

The method of and the basis for determining the reasonableness of rates is one of the most important and interesting questions for consideration today by the representatives of the people, and of the great enterprises which are providing the public with a service.

The reasonableness of rates has, of course, been the subject of discussion ever since service was started and rates charged, but the question has come up for actual determination in a few cases only, and as it involves largely matters of fact, it is doubtless true that the principles taken as guides in early cases were influenced largely by the particular facts and conditions surrounding those particular cases, and such principles should, therefore, stand as a guide in future cases only so far as they shall be found to be applicable and to have been well thought out and presented for consideration in those early cases.

Only within the last few years has the regulation of rates become recognized as a necessary and proper function to be performed by the representatives of the people who are dependent upon these great public services. But now that the practice seems to be well established as a part of our governmental system, we may expect that the question will receive the consideration necessary to establish principles which will fit all conditions, and will take into account the rights of both those who must be served and those who provide the money to build up and operate the enterprises which, when put in motion, not only are permitted to furnish the service, but are required to do so.

Commission Field a New One.

There are already in existence public bodies in half the states charged with the responsibility for the regulation of rates of public service companies. The fact that the principles which govern in the determination of the rate question are not well settled or established is evidenced by the different views of different regulating bodies on this and other questions. Such a difference of views is not surprising as the field is as yet a new one, and there are few, if any, real precedents to guide. Then too, conditions are constantly changing which prevent the establishing of precedents.

With this in mind, it is not out of place to discuss some principles on which there may be some difference of opinion, and it is my purpose to deal briefly with the question of what property is to be included in an investment which is to be taken as the basis for determining whether or not a telephone rate is reasonable.

There may be some question as to whether or not the reasonableness of the rate should be determined by the value of the service to the patron or whether the rate of return on investment as a result of the rate charged determines its reasonableness. I believe there is much to be said on the proposition that the reasonableness of the rate depends upon the value of the service to the community or to the patron, and that so long as rates are not excessive in comparison with rates for similar service elsewhere under similar conditions, then the profits to the stockholders must depend upon management, and that regard must be had for management that is able to earn large returns at the same rates from the same or a smaller investment than exists in other places where conditions are similar, remembering all the time that at least a sufficient return must be allowed on capital legitimately invested to make the investment attractive to investors.

Whichever method may be followed, however, in determining the reasonableness of the rate, the investment in the property giving the service will necessarily be an element in the consideration of the matter.

A telephone property may be confined to an investment in a particular community, or it may comprise a system of exchanges and intercommunicating or so-called toll lines. The exchanges provide several classes of service for which different rates are charged and when intercommunication between exchanges is had, different charges are made for different distances and for different lengths of time of conversation.

What Property is to be Considered.

The reasonableness of the rates for any one of the classes of service mentioned may at any time be questioned, and either as a basis or as an element in determining the reasonableness of the particular rate, an investment must be ascertained. The question is, what property is to be considered in making up that investment?

Most of the cases which have been considered by courts or commissions have involved only a property which was confined to some particular city. This is true of the telephone cases as well as others, but in some of the telephone cases the property involved a system of toll lines and exchanges and as a rate for exchange service was in question, an attempt has been made to separate the property in the community where the rate was questioned from the rest of the system.

In some cases it has been attempted to separate the investment and expense involved in providing a particular class of local service so as to determine the reasonableness of rates charged for each class of service by the rate of return which each rate would give on the particular investment involved in providing the particular class of service.

Any such method of separating investment and expense must be based on the assumption that the class of service included in the separation can stand by itself, and that the investment and expense involved can be reasonably and logically separated from the whole. Assuming that such a separation is physically possible and that the service rate for each class of exchange service, or for the intercommunicating or toll service, will be permitted to pay no more than a certain return on the investment involved in that particular class of service, then the company operating the system must have assurances that it is possible to make each class of service pay a reasonable return on the investment involved in providing it; that each exchange will be reasonably profitable and that the toll line and rural investment will be reasonably profitable. Otherwise the failure of any one of the classes of service to return a reasonable profit makes the property as a whole unprofitable.

Business Cannot Be Confined to Limits.

The telephone business, like the transportation business, cannot be confined to any particular limits, but must certainly follow commercial development and should, like the transportation companies, be a forerunner of that development and take its place in the pioneering of unpopulated and undeveloped territories.

The value of a telephone service is in direct proportion to the number of people and extent of the territory that can be reached by it. Terminals are as essential to the value and ultimate success of the telephone service as to the railroad service. To meet the demands of the business, a telephone company must necessarily reach into territories which in themselves will be unprofitable to it, as well as to reach into the territories which are rich agriculturally and commercially and which will patronize it liberally. Such territories have come to be known in all business enterprises as "lean" and "fat" territories.

To take this necessary part in the commercial department in a community, state or country, and to provide a reasonably comprehensive service, it is necessary that the telephone company furnish service to certain classes of patrons in it exchanges which may be unprofitable to it. It must go further and build its long distance lines and establish exchanges in "lean" territories, the revenue from which may not pay the expense of its operation in such territories.

Telephones an Investment, Not a Speculation.

If this "lean" territory is to be developed, investors in telephone properties must be assured of a reasonable return on their investment from the beginning or must go into the business as a speculation with the idea of very large future profit. The telephone is so well developed now and the regulation of rates of return on investment is so common, that I think it must be conceded that money which goes into telephone enterprises must go in as an investment rather than as a speculation and a reasonable return thereon must therefore be assured from the beginning.

We can well imagine that without assurance that capital will receive a proper return from its investment, and that therefore some way will be provided by which money invested in "lean" territories will earn a reasonable return, no capital will be so invested and will either look for other means of investment or will all go into the so-called "fat" territories.

From either a commercial or economic standpoint the "fat" territory and the "lean" territories are inseparable. The "lean" territory has even its meager commercial development only because of the "fat" and the "fat" territory has developed and become fat only because of the "lean."

To say that the fat territory must help support the lean so far as the telephone business is concerned, establishes no new principle of business but is in accord with the principle of all commercial development. It need not be assumed from this that the "fat" territory will pay more than its just proportion of the burden, as without any sort of regulation or supervision, intelligent selfishness on the part of the telephone company would lead it so to distribute the load as to bring about the greatest development of the enterprise and encourage the good-will and support of all its customers. But if the telephone company cannot be depended upon for this, the regulating bodies can be.

Many Stations Are Not Profitable.

It must be acknowledged that many railroad stations are not profitable and many do not even pay their way. So with telegraph offices, branch banks, postal stations, post-offices, etc., yet we would not say that these units which do not pay their way should be discontinued, nor would we say that private capital which may be invested in them should operate for the benefit of the general public without a reasonable profit. Each of these units is a necessary part of a whole, and its maintenance is necessary to preserve the integrity of the whole and results in the greatest good to the greatest number.

So with the telephone stations and lines, all do not and cannot, in the very nature of things, pay their way, yet they must be continued as a necessary part of the whole system and the elimination of one lessens the service and economic value of the part that remains. The weakness of a limited service is evidenced by the fact that a company which does not meet the demands for service and extend first within the community, then beyond the bounds of the local community into the rural districts, then to the next community and so on, fails, or is forced to give way to an enterprising rival which provides such an extensive and comprehensive service.

The expansion and development of the telephone service must go on with the conviction that, in the future as well as in the past, there is the lean and the fat territory to be served. And a reasonable return to the investor must come from the operation of the enterprise as a whole rather than that each part must pay its way. It seems unquestionable that the same rate of return cannot be expected from the lean territory as from the fat.

We have, so far in this discussion, assumed that the investment in and expense for operating the property as a whole, can be logically separated into several classes, which we have arbitrarily chosen to term exchange, toll, rural, etc., but such a classification or separation is purely arbitrary and cannot be logically or accurately made.

It is probably a fact that in the early days of electric light, power, railroad and telephone, the interurban features of these services were thought less of than the strictly urban, and while a more extensive service of these utilities is now, and has been recognized, the interdependence in connection with each class of service provided by each of these properties has not been fully realized and the properties have often been classified in bookkeeping methods and otherwise as they were thought of in the early days. Therefore, a separation has been attempted which will show the property and expense divided as between exchange and toll, exchange and rural, etc. And, while such an attempt at separation as this may serve some of the purposes of management, it is not logical nor accurate and establishes no proper basis for use in determining the reasonableness of rates.

Local Service Not the Only Factor.

In the early days a telephone plant was engineered and constructed with a view only to a local service, and even then to care for only a limited number of subscribers. Little was thought of providing facilities which would meet the demands of a rural and an interurban service. But, today, telephone transmitters are constructed with a view to long line as well as local conversations, and the old local service transmitters are a thing of the past. Switchboards are engineered and constructed with circuits to meet the demands of a long distance service. Toll switchboards and rural service equipment are planned for, and switchboards engineered and constructed, to meet such demands.

Exchange construction takes into account long distance service and wire of a sufficient size and type is used to make long distance service satisfactory and possible. Central offices are constructed to accommodate and care for the long distance or interurban part of the business. Cable and subway facilities to care for the long distance traffic are considered and provided for. Engineers, operating people, and officials are educated in both branches of the work, local and long distance.

The long distance service and the local service are so closely related in all particulars as to make them inseparable and in speaking of the long distance service, it must be remembered that this means only a service with other exchanges, and other communities, and without those other exchanges and other communities there would be no long distance service, so toll service means terminals and terminals mean exchanges.

The electric railroad company, which in the early days

(*Continued on page 142.*)

Telephone Expansion in Cuba.

The accompanying diagram affords a graphic picture of the extension of the telephone in Cuba. It is issued by the Cuban Telephone Co., which is now operating the automatic system in the island, the equipment being manufactured by the Automatic Electric Co., of Chicago.

The chart shows that, at the time when the present company took over the reorganization of the Havana plant, in 1909, there were less than 3,900 telephones in

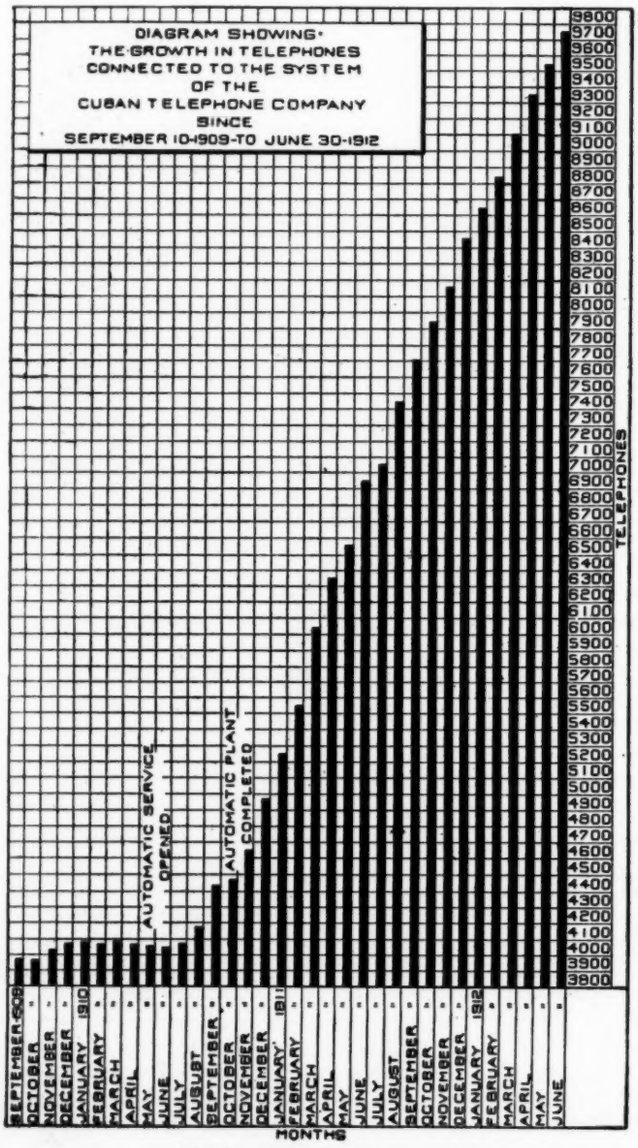


DIAGRAM SHOWING THE GROWTH IN TELEPHONES CONNECTED TO THE SYSTEM OF THE CUBAN TELEPHONE COMPANY SINCE SEPTEMBER 10-1909-TO JUNE 30-1912
AUTOMATIC SERVICE OPENED
AUTOMATIC PLANT COMPLETED
TELEPHONES
MONTHS

An Interesting Exhibit From Cuba.

operation. Upon the completion of the automatic system a year later, there were between 4,400 and 4,500. Since then the number of subscribers has steadily increased, month by month, until, on June 30, 1912, there were over 9,700 connected.

Minority Report of Stanley Steel Committee.

Following are some of the recommendations of a minority of the special Stanley committee elected to investigate the United States Steel Corporation. These are designed to safeguard competition and prevent monopoly. The majority report was presented in these columns last week.

1—Constructive legislation—all corporations exceeding $50,000,000 in capitalization or valuation must became United States corporations before entering interstate commerce. For smaller corporations United States charters are voluntary.

All United States corporations must be recapitalized at their actual value.

An Interstate Commission of Industry, like the Interstate Commerce Commission, to be established; publicity to be provided for.

When the price fixed by a United States corporation has been found to be unreasonable the Interstate Commission of Industry must publicly declare that fact and recommend a reasonable price.

Interlocking directorates and "holding" companies forbidden except when permitted by Interstate Commission of Industry.

It foregoing recommendations shall prove insufficient to meet the trust problem the Interstate Commission of Industry ought to be given a carefully guarded power to decree maximum prices when necessary.

2—Palliative legislation—Industrial corporations not to own common carriers.

"Unreasonable restraint of trade" defined, and burden of proof of "reasonableness" transferred to the defendant.

Individuals and states to have the opportunity to intervene in government suits.

Extensive powers and instructions for courts when combinations are adjudged illegal.

More Details of Tunnel Financing.

The following statement has been made to depositors of the securities of the Chicago Subway Co., under terms of the reorganization plan of November 14, 1911.

The accounting, which follows, is a summary of the reorganization committee's report as of July 15, 1912.

The assessments paid in under the reorganization plan aggregated $4,873,776, which is more than $400,000 short of the total possible amount. The funds thus received have been set apart as follows:

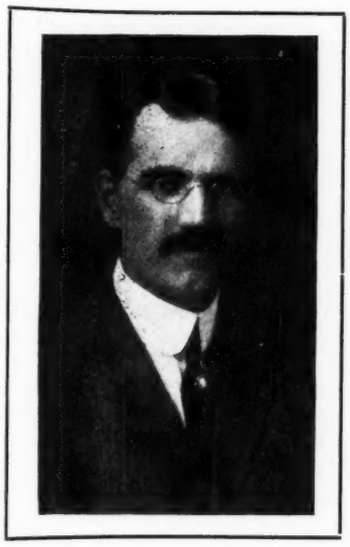
Receivers' certfs., due April 1, 1912, purchased and canceled	$3,605,000
Account Independent Telephone & Telegraph Co., (long-distance connection)	50,175
Purchase of receivers' note to provide funds to protect property, canceled	100,000
Deposit to qualify bidder at sale under foreclosure Illinois Tunnel Co. mortgage	100,000
Adjustment with Joseph Harris for telephone construction, in addition to contract price	456,625
Purchase price under foreclosure Chicago Subway Co. mortgage	50,000
Advanced for working capital Chicago Tunnel Co.	100,000
Balance in hands of committee, applicable to or on account of receivers' debts in excess of cash assets in their hands, receivers' fees, compensation of counsel, costs and allowances, and other liabilities under the decrees covering the acquisition of properties, and for expenses connected with the reorganization and the issue of the new securities	411,976

As it has not been possible to make provision for the payment of the $1,000,000 receivers' notes and the $30,000 interest thereon which became due July 1, 1912, out of the funds in the hands of the committee, the court has ordered the extension of the time of payment of the same until July 1, 1913, and has directed the lien of the same upon the properties of the Tunnel company to be preserved and continued.

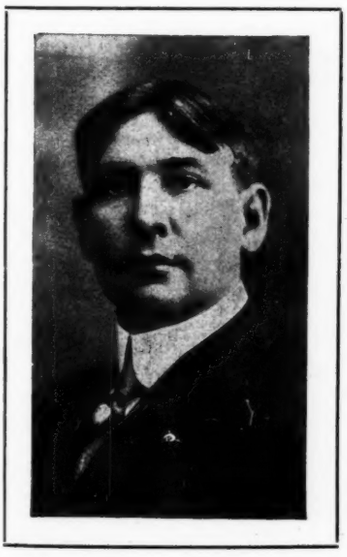
Any balance of the above scheduled reserves will be applicable to these notes or to meet necessities of the new company, and any deficit will be met by the use of reserve bonds.

A Quartet of Men Prominent in the Telephone Field

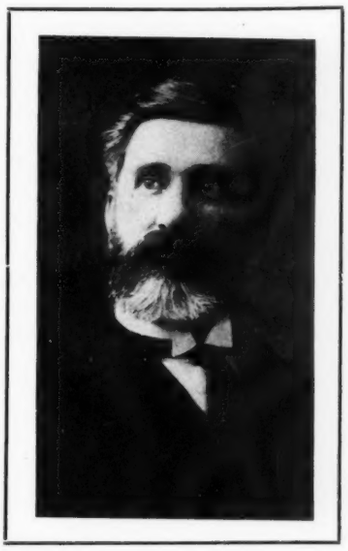
WILLIAM BENJAMIN JACKSON, a member of the firm of D. C. and W. B. Jackson, Chicago and Boston, was born in Kennett Square, Pa., July 23, 1870. In 1900 he received the degree of B. S., and that of M. E. in 1906, from the Pennsylvania State College. He is a member of the Western Society of Engineers, the A. I. E. E., the American Society of Civil Engineers, the American Society of Mechanical Engineers, etc., etc. He is a 32° Mason, member of the Union League Club, Chicago, and many others. Mr. Jackson's engineering work began with the early development of polyphase transmission and distribution of electric power for the Stanley Electric Mfg. Co., of Pittsfield, Mass. He has been actively engaged in the engineering field for the past twenty years, in all branches of electric light and power especially in rate and development studies in the telephone and general electrical fields. His firm is retained by the Massachusetts Highway Commission. It has also been engaged by the cities of Chicago and Baltimore and by the English government.



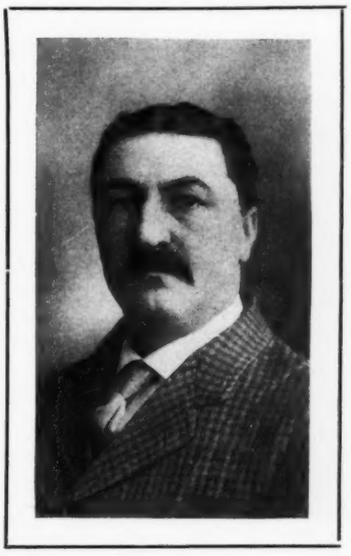
BUFORD ADAMS, general manager of the Brazos Valley Telegraph & Telephone Co., Waco, Texas, entered the telephone field in the early 90's, as manager for the Missouri & Kansas Telephone Co. at Carrolton, Joplin and St. Joseph, Mo. His experience with this company marked his entry into general commercial life, as well as into the telephone business. Mr. Adams was born in Carrolton, Mo., July 11, 1876. He received a common school and a high school education. He is a member of the Knights of Pythias and is a thirty-second degree Mason and a Shriner. Leaving the Missouri & Kansas company, he went with the Colorado Telephone Co., at Denver, entering the engineering department. Later he became superintendent of maintenance at St. Joseph, Mo., for the Gary System, which extends over a wide field in Missouri, Kansas and adjoining states. Mr. Adams left the operating field and associated himself with the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., which he left to assume his present connection, at Waco, Texas, with the Brazos Valley company.

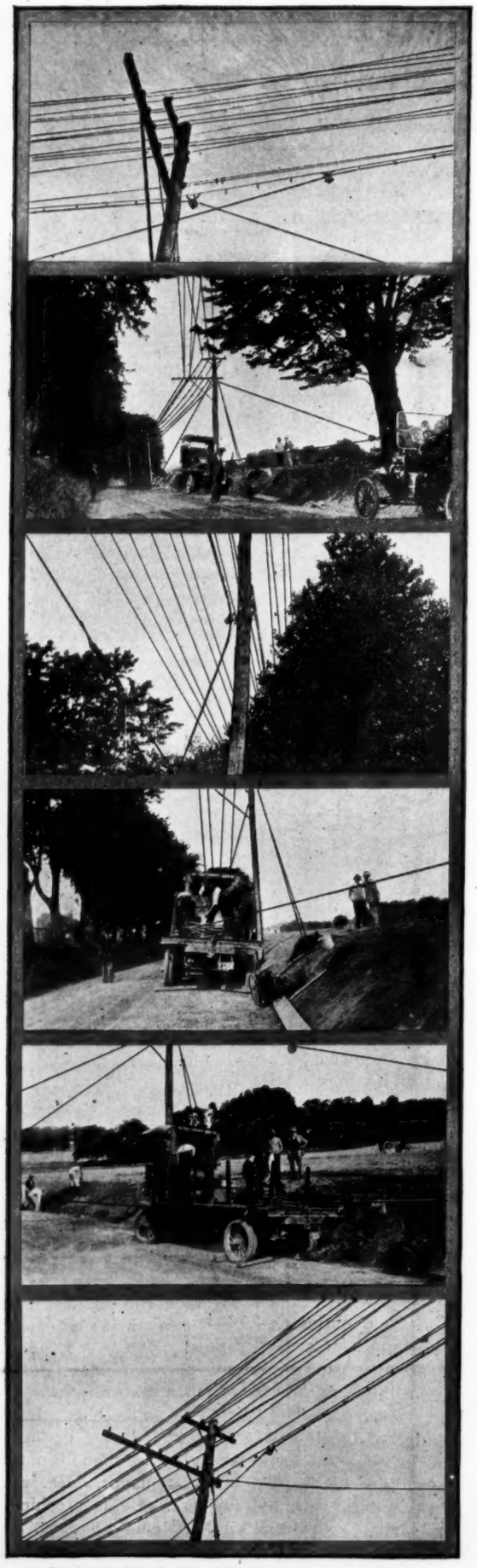


J. WALTER BARNES, secretary and manager of the Consolidated Telephone Co. and the National Telephone Co. of Monogalia County, with headquarters at Fairmont, W. Va., was educated in the Fairmont State Normal School, the law department of the University of Virginia, Clark University, Worcester, Mass., and the West Virginia University, receiving the degree of A. M. from the latter. He was born in Fairmont, September 3, 1862. In his early years he taught school. From 1885 to 1901, he was connected with the Fairmont State Normal and, from 1892 to 1901, was its principal. He has been a director of the Fairmont Trust Co. since its organization, in 1902, and is a member of the Fairmont Chamber of Commerce. He was a candidate for Congress in 1904. In 1902 he became manager of the Consolidated company, in 1909 secretary, treasurer and manager of the Monongalia company and, in 1910, secretary and manager of the Weston Central Telephone Co., in which capacities he has since served. He has been prominently identified with both state and national associations for many years.



WELLINGTON S. CLAY, manager of the Hutchinson Telephone Co., Hutchinson, Minn., was born in Oronoco, Minn., January 19, 1870. He attended the public schools of his native town, learned the printer's trade and ran a newspaper for six years. A new long distance line having accidentally terminated at his office, through lack of poles to build farther, he entered the telephone business. He organized the Hutchinson company in 1899, since which time he has been its manager. Mr. Clay has aided in the organization of three state associations and has served as secretary of the present one for two years. He now its vice-president. He also organized the Inter-County association and was its president. He has built the local exchange three times and has built 200 miles of rural lines. He has served as judge of local courts for eight years and as secretary of the school board. He is now serving his second term as mayor. He was for ten years in the insurance business. He is president of the Hutchinson Commercial Club. He is a Mason, an Odd Fellow and a member of a number of other orders.





Aerial Cable Pulling With Automobile Truck.

Double Pulls on Aerial Cable With 3-Ton Truck.

Aerial cable was installed in double pulls on Meeting House Road, Jenkintown, June 15, says a writer in The Telephone News, Philadelphia, through whose courtesy the illustrations are reproduced.

On June 8, two 1,300-foot pulling ropes were pulled in in the first two sections west of Second Street Pike. This took five men one hour.

On June 10, the auto truck and gang arrived on the job at 8 A. M. The two reels for the first section were set up and ready to pull at 8:35. The double pull, 1,300 feet in each section, was made in 23 minutes. Reels were lagged up and gang was ready to move at 9:10.

Ropes for the second double pull were pulled in from 9:15 to 9:50. Reels were set up by 10:20. Ten minutes' delay was caused by a difficulty in setting up one reel on the steep bank of a gutter. We started to make this double pull ot 10:25. The two sections were 1,255 and 1,250 feet respectively. The reels were lagged up and gang was ready to move at 11.

We started to make the third double pull at 11:05, but were delayed ten minutes by the rope becoming entangled. The ropes were in at 11:55 and reels were set up at 1:15. We pulled in cable from 1:20 to 1:45. The two sections measured 1,250 and 700 feet respectively. The 700-foot piece was cut off of a length of 1,155 feet, as the remainder had to be pulled in a Western Union line above it, while the 700-foot piece was pulled in below this line. The reels were lagged up and ready to move at two o'clock. We reset the reel, pulled in the high section of 455 feet and moved to Jenkintown at three o'clock.

On Jenkintown Road, east of Washington Lane, we pulled up 565 feet of cable by four o'clock.

We returned the tools to the storehouse and picked up the skid boards at Second Street Pike. We left for Philadelphia at 4:45 P. M.

The cables installed were of the following sizes:

Pull	Section	Length	Size	Gauge
1	1	1300	25	16
	2	1300	25	16
2	3	1255	25	16
	4	1250	50	16 and 19
3	5	1250	50	16 and 19
	6	700	50	16 and 19
4	7	455	50	16 and 19
5	8	565	50	19
Total,		8075 ft.		

Cost of the work:

Auto truck, 1 day @ $9.02	$ 9.02	
Labor, 5 men, 9 hours @ .347		$15.62
Labor, 2 men, 9 hours @ .20		3.60
		$19.22

Summary.

	Total	Cost Feet
Auto truck	$ 9.02	$.0011
Labor	19.22	.0024
Total	$28.24	$.0035

On June 15, at Sixteenth and Venango streets, 600 feet of 22-gage cable was installed in double pulls with the aid of the three-ton truck. There were five sections of cable pulled of 458, 574, 283, 359 and 193 feet long, respectively. Double pulls were made on the first four sections.

This job took seven men and a foreman three hours to complete.

Eight men, 3 hours each, 24 hours @ .35 per hour	$ 8.40
Three-ton trucks, 3 hours @ 1.002 per hour	3.01
	$11.41

	Total	Cost Feet
Labor	$ 8.40	$.0045
Truck	3.01	.0016
Total	$11.41	$.0061

Are We in Trouble?

Professional Unresters—Our Woeful(?) Condition

By J. C. Kelsey

Ever since Adam fell from grace, somebody has been hunting or predicting trouble. We have been on the broad and easy way to ruin ever since the first newspaper originated the interview—and met some citizen returning from a foreign country, by boat or dolphin's back.

Prominent bankers, returning from Europe, resting after arduous labors of signing their names, or refusing to loan money to deserving home industries, always bring home disturbing stories.

We hear that there is great unrest in Europe and that the gutters will be flowing with the precious blood of human beings!

Merely because a woman threw a sharp hatchet at the prime minister of England—and of course missed him—potatoes have gone to absurdly high prices in Ireland, and rye bread is sky-rocketing in Belgium!

And we learn from these blasé gentlemen of finance, that Japan is simply bound to grab the Philippine Islands. Also that every Japanese fruit-picker is a Japanese general in disguise!

And worst of all, Germany has her eye on South America, and hates us because of the Monroe Doctrine!

One would believe that the dogs of war were really growling and that nothing could hold them from jumping at each other's throats.

Too bad! I am in favor of a high duty being placed upon interviews. Something drastic must be done to protect our country from something beside cheap labor.

Protection is a great thing if it works along the proper lines. But it fails miserably to guard us from these mental shockers.

How can we go to sleep at night when we know that the Germans are going to punch holes in our beloved Monroe Doctrine?

How can we get far away from the family musket, which at one time was such a household necessity?

It is awful! But it must be the fault of the constitution. Everything else is!

Our constitution covers a multitude of sins and serves as a most useful weapon. How could the income tax measure be so comfortably killed?

Our revolutionary forefathers did a better job than they suspected. They gave lawyers and judges a most lucrative and convenient weapon.

I read some constitution the other day. It ran like this:

"No telephone company owning a parallel or competitive line shall consolidate its capital stock or property, or pool its earnings in whole or in part, with any company having parallel or competitive lines."

Is not that as plain as the nose on your face? To a man with ordinary intelligence, it would seem that it would be "all off" with consolidation.

But it seems that the constitution did not mean what it said, so it followed up the above declaration with:

"Parallel and competitive lines may consolidate if the proper municipal authorities, after investigation, determine that no substantial public benefits result from separate existence of such companies."

What a picnic for a bunch of judges! Four judges could take the first part of the constitution and vote against consolidation. Three judges could take the second part of the constitution and vote for consolidation. And both bunches would be perfectly right.

Really, it is a beatific condition! It would be wrong to build any constitution so it could be fully understood. I often think how our warlike forefathers smiled when they wrote the constitution.

They winked at each other as they said, "You may not," and a moment later put in "You may!" It takes great brain work to work up a good elastic constitution!

I have an idea anyway that black is really white and white really black!

Thank Heaven! I am not losing sleep over the marvelous constitutional treasures possessed by our government and the various states.

Counting lodges in, there must be at least a million good, sound healthy and reversible constitutions in our country!

Lately, we learn that the Stanley committee, after two years of great labor, has wisely concluded that the control of trusts is beyond the power of Congress.

And the poor fellows worked with midnight oil for weeks and weeks, trying to persuade themselves that the constitution gives Congress power to act.

Alas! Alas! The constitution made no mention of congressional control of trusts!

Our forefathers were so busy killing Indians and hustling for three meals a day, that they never dreamed that any Rockefeller would ever care to go in the oil business and grab his neighbor's refinery. To them, such a proceeding seemed useless.

Our ancestors were not prophets at all. Why did they not realize that a man would not be contented with the tobacco in his back yard?

What a joke! The constitution does not give Congress the power to control trusts. Well, let's tear up this jocular document, and make a nice brand new one. Let's get up to date, and see why Congress can't do something.

Poor old Congress! So belittled that no man can even be a candidate now and conceal his shame!

The constitution, or the law, or something, is pretty lame on the trust question. Three great trusts have been convicted of commercial murder, such as raising prices of commodities, robbing weaker rivals, corrupting legislatures and oppressing the public. But there was really no punishment. In fact, the punitive power in these cases is surely weak.

The law, which will swoop down upon the luckless individual with such relentlessness fades away when it meets the financial strength of a corporation.

The government, with the ferocity of a bull dog, goes after a feeble-minded counterfeiter, who painfully works for a week imitating one of our precious dollar bills. But the sucking dove of a midsummer night's dream typifies the law when it contemplates great finance.

So far it has been found impossible to unscramble the egg. But a scrambled egg can putrify and decay. And that is exactly what can happen to great trusts.

Some say that trusts can not be destroyed. I am sure

they can not be hurt externally. But no man can guarantee the perpetuity of a mollycoddle trust management!

No man can promise that there will never be a process of disintegration. Trusts must keep on growing. They are like insurance companies. To stand still means to weaken.

Once let a trust reach its maximum, and it will at that moment start inevitably for the minimum. There can't be a standstill. If it does stand still, it loses its terror.

The only thing that bluffs the public is the speed of the trust's progress. As long as it keeps constructive forces busy, we look upon it with awe. Let it fall back upon maintenance and operation alone, and public contempt will set in.

The old lion had been a bitter tyrant. At last his teeth wore out and his magnificent body failed to respond to the muscular requirements of his strenuous life. All the animals abused him. Finally the ass kicked him. That was too much—it broke his heart!

First the competitors of a stand-still trust kick it. And finally, that modern jackass, the public, will get up enough courage to kick at it too.

When the public does that, our poor trust's heart will break, sure enough!

There is an end somewhere. The earth is only 8,000 miles in diameter. We look pretty small to other star-gazers!

It is all beyond the constitution. If Congress is denied the opportunity to control trusts and thereby protect them, nobody but the trusts will suffer and then it will be from their own folly.

Congress has protected the trusts so well that they have developed beyond Congress. Bosh! And we are surprised!

A woman once said she thought the thing that would startle her the most would be for her baby to speak to her. Of course that was impossible.

Yet the speech of our baby trusts has more than startled us. And we have started to punish them for their fearful temerity, but find no one has the power to punish. That is the queer part!

There are numerous trust remedies. Chairman Stanley wants to limit the output—in other words, limit the gross sales to a percentage of the present. If Chairman Stanley would recommend a stationary price condition, he would put a stop to it.

The loading for big business is always out of proportion. And nothing but a price increase can help.

Anybody knows that a small shop can make any product cheaper than a big one. The only thing which saves the big shop is the demand and its ability to boost the price.

Make the price on a small shop basis and your factory trust would die quickly.

No one wants to limit a railroad to a few miles in length. We merely limit its rates.

This is the same application as limiting the price charged by trusts to what it costs a small independent factory to make the same article.

When the trust competes with the small independent factory, then prices are low enough. But when a trust has a favored customer, or one in which it holds a heavy stock interest, there is no limit to price, and thereby a danger to competition is always imminent. Minority stockholders pay for many things unknowingly.

It is not a trust condition that gives us through trains from New York to Chicago. It is a competitive condition, pure and simple. If the New York Central and the Pennsylvania railways belonged to one band, don't think for a moment that such service would exist.

Don't give Standard Oil too much credit because it made oil cheaper to the public. It primarily made oil cheaper to the public to kill off competitors, and then found it inconvenient to raise the price.

The virtues of a predatory corporation exist only in print. They do not exist in any other way.

This is necessary because few great trusts are making the money they think they are. The expenses of a trust would appall you, even on a relative basis. And nothing but a price increase is the way out. So the endless chain goes on!

But why worry about it? Why worry about Germany, Japan and the boll weevil?

Why bother about the poor old constitution written so long ago? Let's get up a new one!

When Bill Nye heard about Peter Stuyvesant buying Staten Island for $24, he exclaimed, "What was my fool grandfather doing about that time?"

I feel that at the time our constitution was made our grandfathers were merely human and built a document to fit their own experience. One can learn only from experience.

Everything worth while in the world has been developed on a cut-and-try basis. And don't forget that it is a case of the devil getting the hindmost man!

Human nature of 1912 had no earmarks different from our colonial human nature. For fortification purposes, the tanner favored leather, the carpenter thought wood was better, and the mason insisted that stone alone would do.

The New York stock exchange crowd wants things its way. And we in the provinces want everything our own way. And the conflict will never end!

The conflicts of peace are much more deadly than those of war. The conflicts of our grand-children will be sharper and a great deal more deadly than ours. Let's not make them mollycoddles!

That is what we are trying to do, and if we succeed they will curse the day we existed.

Trust owners should not be too sure of "Resting in Peace."

The weather is cooler!

MORAL:—It's a wise constitution that straddles the fence!

Baltimore Rates Said Excessive.

H. Findlay French, lawyer, secretary of the Baltimore Board of Trade, who was appointed to analyze and tabulate the figures showing telephone rates in various cities, has presented his first report to the Baltimore Protective Telephone Association. The latter is fighting the Chesapeake & Potomac Bell's alleged high rates in vogue in Baltimore.

The report, which is incomplete and has not been considered by the executive committee as a whole, shows that Baltimore's telephone rates are excessive. The report will be ready for publication in a few days. Mr. French and Frank H. Cline have just been elected members of the executive committee of the association.

The Wiring of Large Buildings for Telephone Service

An Abstract of a Paper Presented at The Annual Convention of the American Institute of Electrical Engineers, Held in Boston in June — This Concluding Installment Discusses the Layout of and Methods Used in Wiring Lofts, Hotels and Apartment Buildings

By Frederick L. Rhodes

Conduits for wires or cables are rarely provided in loft buildings. The riser cables are placed in shafts and the wires are distributed on each floor along the baseboards. The wire center on each floor is usually at the baseboard near the passenger elevator shaft. Although this arrangement is undesirable in many cases, it is difficult, on account of the floors being undivided and the locations of the telephones not being known until the premises are occupied, to make any provision in advance for distributing the wires. A system of conduits and floor boxes would be expensive and is not considered necessary.

Where one firm occupies the entire loft building, the size of the riser cable is determined entirely by the equipment of the private branch exchange switchboard and the probable future requirements of the firm as to telephone service. In a case of this kind the center of the wire system is at a cross-connecting box located close to the private branch exchange switchboard.

A modification of the method of distribution already described for office buildings is usually employed in loft buildings. The riser cable is divided into two parts termed "bridged feeder" and "house cable." The house cable pairs are terminated in the main terminal box near the foot of the riser, and the bridged feeder pairs are directly connected to pairs in the exchange cable and also by a branch splice, are terminated in the main terminal box.

Fig. 6 shows the floor plan and cable distribution of a twelve story loft building. It will be noted that the arrangement of pairs does not agree with the preceding statement that in loft buildings the riser cable is divided only into bridged feeder and house cable groups. This diagram shows, in addition to these groups, certain direct feeder pairs. The reason is that it is expected this particular loft building will sooner or later be partitioned off for office use, and this condition has been anticipated in planning the cable distribution.

Hotels and Apartment Buildings.

The telephone systems for hotels and apartment buildings differ from those for office and loft buildings in one important respect. Hotels and apartment buildings can be wired in advance on a permanent basis, on account of the probability that there will be no essential change in the number of wires needed, the ultimate requirements being closely determined by the number of rooms or apartments. The locations for the telephones in the various apartments or rooms are also generally permanent and the relative locations of the telephones are the same on each floor.

The telephone system installed in these buildings consists of a private branch exchange switchboard located at some convenient point, usually on the ground floor. In hotels this private branch exchange switchboard is placed in or near the office. Telephones are installed in each room or apartment and wired to this switchboard. The latter is connected by the necessary number of trunk lines with the nearest central office of the telephone company.

The wiring problem is simple in comparison with that in office buildings. It consists of running a pair of wires from the telephone location in each room or apartment, to a common center in the cross-connecting box near the private branch exchange switchboard. It is important to make provision so that the telephone company can run its wires from the cross-connecting box of the private branch exchange switchboard, to some point in the base-

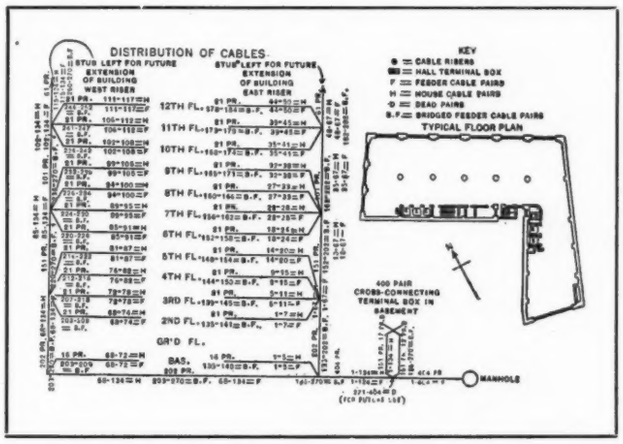


Fig. 6. Loft Building Floor Plan and Cable Distribution.

ment where connection can be made to the central office cable. The latter cable is generally not run in conduit but is clamped to the ceiling of the basement.

Conduits for distributing wires on floors in hotels or apartment buildings should not ordinarily be over 50 feet in length nor should they have more than three bends with a minimum radius of five inches. Any conduit 100 feet in length should not be less than one inch in diameter: five-eighth-inch conduit should be provided for a maximum of two pairs of wires and three-quarter-inch conduit should be provided for a maximum of four pairs of wires. For more than four pairs of wires, it is preferable to run cable.

In laying out the wiring system for hotels, in addition to one pair of wires for each room, as mentioned above, provision has ordinarily to be made for a small percentage of spares to provide for defective pairs and for a few direct lines.

From the wire center at the cross-connecting box near the private branch exchange switchboard, a cable is extended through the basement or sub-basement to the foot of the riser shaft. The riser cable extends up this shaft as a diminishing cable with subsidiary terminals located at convenient points on each floor for reaching the various rooms. The wires are distributed on the floors either by molding or through conduits, as the case may be.

In many of the modern hotel buildings, complete conduit systems are provided for concealing the telephone wires and cables. In such cases, the vertical conduits are installed at some central point and junction boxes are provided on each floor for splicing and terminating cables. From the junction boxes separate five-eighth-inch conduits are extended to each room. The outlets in the rooms should be located four feet ten inches above the finished floor for wall sets, this having been found by wide ex-

perience to be the most satisfactory height at which to place the telephone. For desk stands the outlets should be at the baseboard near the proposed location of the telephone. Where the floor area and the number of rooms are large, it is often economical to have more than one terminal box on a floor.

Elevator Apartments.

Elevator apartment buildings are generally wired on the basis of two telephones to an apartment, one connecting to the private branch exchange switchboard and the other when desired, directly to the central office of the telephone company.

In most of the high class elevator apartment buildings, it is the practice of owners and architects to provide conduits for concealing the telephone wires and cables. In some cases a vertical shaft is provided instead of vertical conduit.

Where the floor space occupied by each apartment is small and the horizontal runs on each floor are short, a riser or diminishing house cable is placed. This cable is extended up through the building in a conduit or a shaft, as the case may be, and branches containing a sufficient number of wires to provide two pairs for each apartment are terminated in junction boxes located at central points

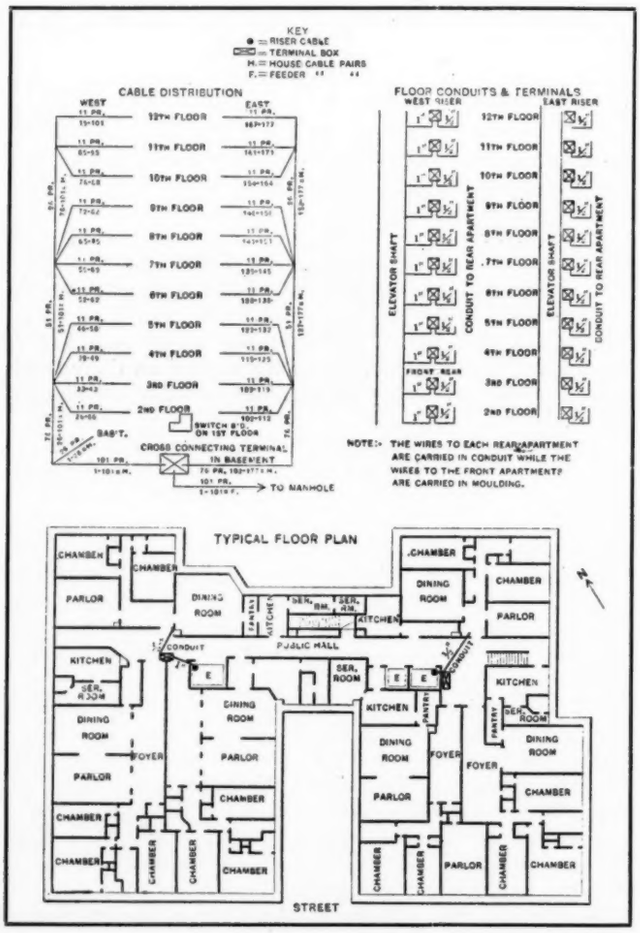


Fig. 7. Plan and Cable Distribution of Elevator Apartment.

on each of the floors. From each junction box, five-eighth-inch or three-fourths-inch conduits are extended to the location of the telephone in each apartment, the outlets being located, as in hotels, at the baseboards, for desk telephones, and in the wall, four feet ten inches above the finished floor, for wall telephones.

This arrangement provides a flexible system, as the wires between the apartments and the subsidiary branches may be drawn in whenever service is required. As the horizontal run of conduit on each floor is comparatively short, the cost of the conduit installation is minimized. There is a further opportunity for economy in installing conduits from the junction box to the apartments, as it is frequently possible to use a single run of conduit for two apartments instead of a separate conduit to each.

In apartment buildings where the floor space occupied by each apartment is large, the above arrangement would necessitate long runs of small size conduit on each floor. In such cases, to avoid the excessive cost of this conduit, the wires are usually distributed to the apartments by a vertical system of conduits extending from the basement up through each tier of apartments. These vertical conduits diminish in size as they approach the upper portion of the building and the outlets in the apartments are located in the walls at the points where the telephones are to be placed.

In the basement, cables are extended from the cross-connecting box near the private branch exchange switchboard along walls and ceilings to the foot of each line of vertical conduits. At these points terminals are established with sufficient conductors to provide two pairs of wires for each apartment to be cared for by the riser. The pairs of wires between these terminals and the apartments are pulled into conduits as service is required.

The size of the vertical conduit varies with the number of apartments to be served. Generally a conduit two inches in diameter in the basement diminishing gradually to three-quarters of an inch at the upper floor, is sufficient to care for buildings 10 to 12 stories in height, and a conduit one and one-quarter inches in diameter in the basement diminishing to three-quarters of an inch at the top for buildings from six to ten stories high.

The number of vertical lines of conduit depends on the number of apartments on each floor. Usually a separate line of conduits is required for each tier of apartments, but it is often possible to care for two adjacent apartments on each floor by a single line of conduit when the telephones in both apartments are to be placed on the dividing wall between them. This arrangement is, however, open to the objection that installers must gain access to one apartment for the purpose of installing the telephone in another. In spite of this objection, from the standpoint of the owner, this method is probably the best for buildings of this class as it minimizes the cost of installation of conduits and is flexible enough to admit of direct lines being installed when such service is required.

Fig. 7 shows a 12-story elevator apartment building with six apartments to a floor and stores on the front of the first floor. The two riser cables are run in the elevator shafts.

A diagram is given showing the junction boxes on each floor and the sizes of the conduits used for distributing the wires on each floor.

Non-Elevator Apartments.

Apartment buildings of the non-elevator class do not, as a rule, exceed five or six stories in height and frequently have as many as 10 apartments on each floor. Building of this class are wired by extending lead covered cables from the cross-connecting box near the private branch exchange switchboard through the basement to the foot of each dumb-waiter shaft where terminals are established. The terminals are made large enough to provide approximately for a direct line and an extension telephone for each apartment cared for by the dumb-waiter shaft, when it is

(*Continued on page 144.*)

Practical Subjects—Letters and Discussions

Cases Where Time and Money Could Have Been Saved.

While in many cases there is just cause for asking for a rate increase, I believe that there are more cases where the stockholder has more cause to ask for a decreased maintenance and construction cost. A few actual cases possibly will remind you where you might have saved some money.

I recently sent in a move order to the construction department, making a note on it that it would require a span of wire besides the drop. An installer came out on the car, but as the "Engineer" had not told him to bring a pair of climbers, he could not put up the drop. He returned to the office, using two hours' time and 10 cents carfare. Nothing done. In a couple of days another man appeared. As he did not bring climbers or drill, he only hung the instrument. Two hours' time, 10 cents carfare, ten minutes' work done.

On the eighth day after the party had moved, I made complaint over the engineer's head to the general superintendent, which I should have done the first time. Within an hour an installer was out on a motorcycle with all necessary tools, re-hung the instrument straight and did a good job. Because the construction department engineer did not understand his business, there was a needless expense of four hours' time and 20 cents carfare and eight days' delay with no service rebate, $2 in all.

In another instance the "heavy gang" left a job and drove 8 miles to set one pole, arriving at 4 p. m. By the time they got out a pole, it was 4:30. As they were not allowed overtime and had to drive back 6 miles to the barn, they left at 4:30. The next morning they finished the job in an hour, with $6 wasted on the road. Then there was other work near where they first started from and they drove back to finish, after setting my pole.

Not only should a man in charge know how to plan the work, but he should know what his men are capable of doing. Three circuits were strung a half mile beyond the telephone cable on electric light poles. When connected up they were noisy. I asked for a man who could transpose.

He came out with one pair of blocks. Said the engineer only gave him one pair, but as he had transposed all one summer for the Bell company, he could do it all right. The lines were still noisy at night, so I investigated. They looked all right, but a closer look did not show any splices, except on the pole pair. A closer look showed that he had simply dropped wire No. 1 to the lower groove and put No. 2 on the top groove of the No. 1 pin. He was quite indignant when another man was told to do it over.

Nebraska. R. C. C.

Telephone Construction on High Tension Poles.

In a late issue of the Electrical World, a description of the telephone line construction of private system of the Whatcorn County Railway & Light Co., of Bellingham, Washington, energy is transmitted over a three-phase, 60,000 volt, single pole line for a distance of 42 miles. The poles are spaced 150 feet apart and are of red cedar with an average length of 45 feet.

The main telephone line is strung on the poles of the high tension line, 10 ft. below the high tension cross arms. Cross arms are of fir (painted), with two galvanized iron braces to each arm, and are double at the same places as high tension arms, as well as at transposition, which are made at every tenth pole. The pins are of locust and the insulators are of glass. The wire is No. 10 B. & S. gage, hard drawn copper. There are eleven 2500-ohm Stromberg-Carlson magneto telephones in use, each protected against breaks in the high-tension line by a General Electric high-tension 1 to 1 ratio, telephone insulating transformer with adjustable spark gap discharge to ground.

Construction Work for a Farmers' Exchange.

Here is a bit of construction in a farmers' exchange which required some careful work to replace. The pole on which the men are working is the new and the one

A Difficult Replacement Job.

on the right is the native white oak, carrying thirty No. 12 iron wires. This work had been up nine years.

While to some construction men, the replacement might seem very simple at first glance, yet it was not without considerable danger that the new work was put into place. The lead crossed a railroad right of way at this point, jumping to the opposite side of an alley to a similar and smaller pole. Both poles were rotten and weak and all wires were nearly eaten up by gases from below.

The old poles were carefully guyed about three-fourths up and used to raise the new poles which carried ten-inch tops. Two men framed and raised these poles, including the digging of the holes which were six feet, six inches deep, in a fraction over a day. A team was used in the raising and a third man employed to drive the team.

Etna Green, Ind. F. L. Whitaker.

Ground on Rural Line Due to Poor Construction.

We had a metallic farm line running about six miles into the country, which at times would become grounded and then would clear up. I had our troubleman inspect the entire line, but he was unable to locate the ground. One day the ground was on the line and I had the troubleman open up the line at several places until we located the trouble within four spans.

He climbed every pole and inspected the line thorough-

ly, but could not find anything. Finally he climbed a little maple tree that had a knob nailed on to it and found the wire tied all right. Upon closer inspection he found that sap running across the knob and to the wire was causing a good ground. After changing the knob to a different position the line was cleared and has been clear ever since.

J. B. Walker, Wire Chief,
Hamilton, Ohio. Hamilton Home Telo. Co.

Trouble Due to Defective Switchboard Lamp.

I am sending you an account of a peculiar case of trouble that I experienced. For several days I was troubled with the fuse, which feeds battery from the power board

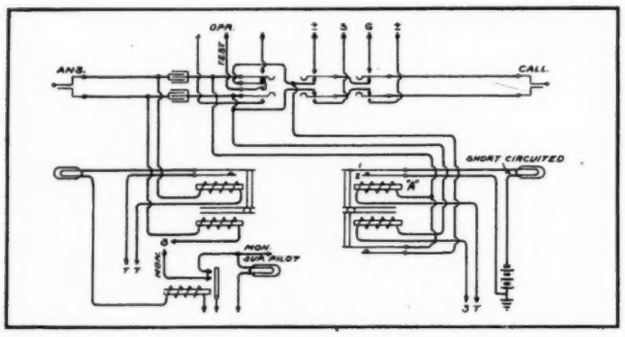


Diagram Showing Short Circuit of Supervisory Lamp.

to the supervising lamps on the calling side of the cord circuit, blowing out. The fuse feeds battery to one-half of the calling cords on one position, and when blown puts eight pairs of cords out of service.

I would replace the fuse and hunt for the cause, but found nothing which would cause the trouble. After a number of searches, I found that when a certain pair of cords was in use, the trouble would occur. Upon further testing I discovered that, whenever the calling supervising relay "A" was energized and was not holding contacts 1 and 2 apart, the fuse would be blown. This would happen before the subscriber took down his receiver or after it was hung up, at the time that the disconnect signal should show.

I found the trouble to be in a lamp that was "shorted out" by the leading in wires being crossed. After putting in a good lamp I had no further trouble. When shorted this way the lamp resistance was cut out and the battery, one side of which was grounded as in most exchanges, would be connected direct to the ground. The lamp circuit on calling side had no other resistance than that of the lamp.

John M. Cosgrove, Wire Chief,
Lawrence, Kans. Lawrence Home Telephone Co.

The Relation of the Horsepower to the Kilowatt.

One of the recent publications of the Bureau of Standards, Circular No. 34, discusses the relation of the horsepower to the kilowatt, an abstract of which is as follows:

There was, before 1911, no precise definition of the horsepower that was generally accepted and authoritative, and different equivalents of this unit in watts are given by various books. The most frequently used equivalent in watts, both in the United States and England, has been the round number, 746 watts; and in 1911 the American Institute of Electrical Engineers adopted this as the exact value of the horsepower. It is obviously desirable that a unit of power should not vary from place to place, and the horsepower thus defined as a fixed number of watts does indeed represent the same rate of work at all places. Inasmuch as the "pound" weight, as a unit of force, varies in value as *g*, the acceleration of gravity varies, the number of foot-pounds per second in a horsepower accordingly varies with the latitude and altitude. It is equal to 550 foot-pounds per second at 50 degrees latitude and sea level, approximately the location of London, where the original experiments were made by James Watt to determine the magnitude of the horsepower.

The "continental horsepower," which is used on the continent of Europe, differs from the English and American horsepower by more than 1 per cent., its usual equivalent in watts being 736. This difference is historically due to the confusion existing in weights and measures about a hundred years ago. After the metric system had come into use in Europe, the various values of the horsepower in terms of local feet and pounds were reduced to metric units and were rounded off to 75 kilogram-meters per second, although the original English value was equivalent to 76.041 kilogram-meters per second. Since a unit of power should represent the same rate of work at all places, the "continental horsepower" is best defined as 736 watts, this is equivalent to 75 kilogram-meters per second at latitude 52 degrees 30 minutes, or Berlin. The circular gives tables showing the variation with latitude and altitude of the number of foot pounds per second and of kilogram-meters per second in the two different horsepowers.

These values, 746 and 736 watts, were adopted as early as 1873 by a committee of the British Association for the Advancement of Science. The value, 0.746 kilowatt, will be used in future publications of the Bureau of Standards as the exact equivalent of the English and American horsepower. It is recognized, however, that modern engineering practice is constantly tending away from the horsepower and toward the kilowatt. The Bureau of Standards of the Department of Commerce and Labor and the Standards Committee of the American Institute of Electrical Engineers recommend the kilowatt for use generally instead of the horsepower as the unit of power.

Local Battery Telephone, the Autoists' Supply Station.

A few days ago an automobile was stalled near here, and the man running the car, after an inspection, found that he had no spark from his batteries. To obtain new cells of dry battery he would have had to go four miles.

This man, unknown to us, did a little thinking and finally took a pair of pliers, went to three of our telephones, told the subscribers that he was having a little trouble on the line. He politely disconnected two batteries from each telephone, put them in his pocket and walked away with them. When he had obtained six cells he went to his car, placed and connected them and drove off. The next day I had three cases of transmitter trouble and had to install new cells to replace the ones which the automobilist needed and took away.

That is not a piece of telephone engineering, but it may be automobile engineering.

Riverhead, N. Y. Chas. Weller, Superintendent,
Baiting Hollow & Roanoke Telephone Co.

"The Dial" Appears in Dallas, Texas.

"The Dial," designated by the publishers, the Dallas (Texas) Automatic Telephone Co., as "A Friendly Message Issued Monthly," has made its initial appearance. The company has adopted this means of getting its bulletin of new subscribers before the public, at the same time giving out anecdotes, short stories, plant information, etc. The first issue, dated July, contains an imposing display of subscribers added between May 25 and June 25, something like a thousand being shown. The company is increasing its list at a tremendous rate, every day registering large gains in subscribers.

Interesting Talks About the Science of Business Building

Last of a Series of Articles Which Commenced in this Paper Last Fall—Fourth and Final Injunction is, "Apply Your Knowledge, Keep Well, Use Your Will, Get Action, Study, Work"—Body, Mind, Feelings, Will Must All be Nourished and Exercised

By A. F. Sheldon

Formulator of Seience of Business Building and Editor of the Business Philsopher

The fourth and last success injunction in this series of talks is, apply your knowledge of yourself, of the other fellow, and of your business.

In other words, use your will. Get action. Since health is a requisite of success, keep health. To do this you must obey the laws of physical well being. Since knowledge of human nature is a big success asset, acquire it. To do this you must study. Since knowledge of your business is an essential, master its technique. To do this diligent application is necessary. If you have done this, you are ready now to enter the business or professional world. Its rewards will be yours if you apply the knowledge attained correctly and get the right kind of action.

Thousands of books are written that will never be published. There are thousands of inventions that will never bring aught to their makers. There are thousands of industrious lives that will end in dispair and defeat. Why?

Because, while many people act, they do not act in the right way to succeed.

Edison says, "Genius is not inspiration, but perspiration." Edison is partly right, but partly wrong. It is more than perspiration—hard work. It is hard work plus and plus. It is hard work plus knowledge? Is that a satisfactory definition to your mind? It is not to mine.

My definition would be, genius is hard work, plus knowledge, plus initiative. It is a combination of energy, acquisition, and constructive imagination.

Hard work only, never made a man a genius or a success. Knowledge only, never made a man a genius or a success. Initiative only, never made a man a genius or a success.

So Edison did not utter a real truth, but a half-truth only. We forgive him because of the humor of his remark.

You can work hard, and waste your energies, because you lack the knowledge to apply your energies in the proper channels. Your mere knowledge may make you a book-worm, and a book-worm is not a success. You may have initiative, but lacking the proper knowledge and the energy to acquire this knowledge, your initiative will be impracticable.

You must know what to do, how to do it and then know how to do it in a better way than the other man, that is, in a new, more original way, if you want to make a big success.

Keep on the beaten track, and you will attain only mediocrity. Get off the beaten track too much, and you will be eccentric. The world might be amused at you, but it would distrust you. Do not desert the beaten track entirely, but add new branches, open up new avenues for achievement, and you will be a success, a genius.

The world is always looking for a better way to do things. The world is willing to pay, and pay high, if the new way proves the better way. Don't dress your window like your competitors, Brown or Green. Find a novel way to place things, some way that will make the passer-by stop and draw near your window.

The reason so many men fail to make successes of their business is because they are afraid of a new idea. They refuse to use their imaginations in new combinations. They hold to the old, while the world is crying for the new.

Novelty! novelty! novelty! cries the bored world, and you display your goods in your window in the same old way that you did five years ago. Do you wonder that the world passes you by?

Do you know your intellect does three things? It thinks; it remembers; it imagines.

Since it can do three things, don't you think you had better use it in three ways? Since memory is a law of success are you wronging yourself by having a poor memory? Especially when there are methods of improving it. Think how important a memory of faces and names are. What patron does not like to be recognized by you, especially by name, when he calls the second or third time.

Great men like Caesar, Napoleon and Grant owed a great part of their success to their accurate memories for faces and names.

There was a time when it was thought that imagination was useful to poets and artists only. Now, however, the professional and commercial world is awakening to a sense of its value. It is Edison's powerful imagination that makes him the wonderful inventor he is—his power of combining one idea with another in a new way.

The phonograph, the vitascope, the electric car, the flying machine were at one time mere mental pictures of the imagination in the inventors' minds. They would have remained so yet, had they not used their initiative to make the pictures real.

The sewing machine at first stood a confessed failure. There seemed no way to stop it from breaking the thread. But a man of genius came along in the person of Howe. He applied imagination, figured out a way to bring the thread down to the shuttle and back again without having it cut. His imagination pointed out to him that if a slit was made along the side of the needle this could be done. Wasn't this use of the imagination on a practical triumph? The great fortunes of the Rockefellers, the Vanderbilts, and the Goulds, and many other of our millionaires, are the results of practical imaginations. There are great fortunes yet to be made by men with the right kinds of imagination.

Get busy! Use your imagination more than you have done in your profession or in your business. See if you cannot hit upon better ways of doing things. Do not let such splendid gifts as your power to acquire knowledge, your memory, your imagination grow rusty for lack of use.

Exercise is the secret of strength for both the mind and the body. It takes work to keep well—either mentally or physically. But does not the glorious health that gives you an appetite to enjoy the good things of the world, that makes the sunshine seem brighter, the air seem purer, the people you meet "good fellows, despite their faults," does it not, I ask, repay your toil a hundredfold—a thousand-fold?

What splendid reserve power a healthy man has! The

happy view he takes of things is a "motor power" for success. He feels braced for the battle. He feels he can do what is more to be done—and more, too. That is half of the fight for success.

The reserve power of knowledge, what a power that is, too! How splendid it is to feel that you have more than the occasion demands; that you have mastered your technique; that you are ready to grasp the opportunity.

Start the battle for success with the proper reserve power of knowledge and strength and you will win. You will if you start with the right kind of action, and keep up the right kind of action.

A word in conclusion: I trust I have made you see that to be a success the composite man must be a success. You must nourish and use your mind. You must nourish and use your body. You must nourish and use your feelings. You must nourish and use your will. Do those four things and you will be a success.

Oregon Independent Buys Bell.

A deal has been concluded at Medford, Ore., whereby the Home Telephone Co. of that city purchased the lines and equipment of the Pacific Telephone & Telegraph Co. at Medford, Central Point, Jacksonville, Gold Hill and Rogue River.

Although the exact terms of the merger cannot be obtained, it is given out by the Home people that the physical value of the two companies' plants is placed at more than $1,000,000. Local capitalists and California men are behind the merger.

W. H. Gore, a prominent banker of Medford, has been named president; C. L. Reames, vice-president; George Ulruch, secretary and treasurer; and A. J. Vance, manager. These and F. H. Crosby, of San Francisco, form the board of directors.

Work will be begun immediately to merge the systems. Long distance service will be maintained over the Pacific company's lines.

New System for Mexican City.

The Mexican Telephone & Telegraph Co., an American-owned concern with headquarters in Mexico City, reports Consul Samuel E. Magill, of Guadalajara, has been granted a concession by the city of Guadalajara to put in an entirely new and modern telephone system, largely underground, at a cost of about $250,000 gold.

While there are two telephone companies now serving this city, the service of each is insufficient and the operators inefficient, so that the business interests of the second city of Mexico will welcome a good service.

The representative of the company claims work will commence at once and that the system will be in operation in about one and one-half years, also that, as American capital controls the company, American methods, apparatus, and material will be used wherever possible.

He further states that the company plans to connect Vera Cruz on the east coast with Manzanillo on the west, thus giving long-distance telephone service between the connecting cities, which include some of the most important in the republic—Orizaba, Puebla, Mexico City, Queretaro, Celaya, Guanajuato, and Guadalajara.

New Spokane Long Distance Ready to Build.

Fifty carloads of material for the initial construction work of the Inland Telephone & Telegraph Co., with offices in Spokane, Wash., have been ordered. The material includes 100 tons of No. 8 and No. 10 copper wire, forty carloads of poles, a carload of insulators, three carloads of arms and one carload of pins.

An engineer, with a party of surveyors, is laying out the route of the new company over the counties of Spokane, Whitman, Asotin, Latah, Nez Perce and Lewis.

The officers of the Inland company are John W. Fisher, president; Ed. Keefe, vice-president; and George R. Boomer, general manager. In discussing the company's operations, Mr. Fisher said:

"We will be talking over our lines into the Palouse country in less than sixty days. We have no expensive exchanges to build and have nothing to do but set up our poles and string our wires, connecting with every independent telephone exchange along our route.

"The company is financed entirely by local capital and is Independent in every respect. The only connection we have with the enterprises of T. S. Lane will be a physical connection for the handling of through traffic. We have over sixty contracts with Independent telephone companies, which for years have been anxious for connection with Spokane. Our company is not in the telephone exchange business and we will have no exchanges as far as the present plans are formulated."

Mr. Fisher is one of the pioneer Independent telephone promoters in the northwest. He began with a small exchange at St. Maries, which has since developed into the Interstate Telephone Co., Ltd., a part of the Lane properties, the holding company being the Interstate Consolidated of Spokane.

Petition Against Birmingham Merger Denied.

The petition for an injunction filed by T. A. Davenport seeking to prevent the sale of the Peoples Home Telephone Co., of Birmingham, Ala., to the Southern Bell Telephone Co., has been denied by Judge H. A. Sharpe of the city court.

The petitioner claimed that he would be damaged by the sale, and sought to enjoin the Southern Bell from acquiring the property of the competing company. The suit has been pending in the city courts for some time, and was filed shortly after the cancellation of the franchise and sale of the property was authorized by the board of city commissioners.

Judge Sharpe held that the petitioner, being a subscriber, could not be damaged beyond the terms of his contract, and that the cancellation of the franchise was within the power of the city commission.

Oregon Farmers to Connect with Independents.

A large number of farmers interested in rural telephone lines met recently at Morgan, Ore., to discuss the situation generally and determine whether or not to connect with the Pacific Bell system. Eventually the Bell proposition was turned down and an arrangement was entered into with the Independent interests. Among the latter was J. B. Middleton, general manager of the Home Telephone Co., of Portland.

It was decided to install a new 100-line switchboard at Monroe and to build lines to Bellfountain and Corvallis. Other meetings are to be held later.

Opposition to Detroit Merger Withdrawn.

Opposition to the proposed merger of the Bell and the Home telephone companies in Detroit and Wayne county, Mich., has been withdrawn by the Independents of the state, all having agreed as to the terms of the order which the railroad commission is to be asked to issue. The details of this order will soon be given out.

New Construction in Illinois.

The Lexington (Ill.) Home Telephone Co. is stringing a new No. 10 copper circuit from Lexington to Bloomington.

An Old Man's Call Inspired a Distinct Note of Weariness.

The Call of a Vigorous Young Man Was Cheerfully Met.

Interesting Psychological Study of Telephone Girl

One of the big telephone companies is conducting a thorough series of scientific tests to find out why the "hello girls" sometimes give us the wrong number, why they cut us off in the middle of a most important sentence, why they sometimes answer sharply when we make a modest protest, and, in short, to find out what every telephone user would like to know, says the Pittsburgh Gazette-Times.

The tests are being conducted principally at Cambridge, Mass. Observations are being made upon 75,000 telephone girls in many parts of the country. Professor Hugo Muensterberg, the well-known professor of psychology at Harvard University, has been called in to assist in making the tests, but he is only one of the many experts engaged in the work.

One of the psychological experiments tried by Professor Muensterberg was as follows: He gathered all the new girls in the Cambridge Central together and gave each of them a copy of the same newspaper, with the same three columns marked in each. Every girl was required to go over the columns in order and cross out all the letter "a's."

Some of the girls crossed out 90 per cent. of the letters in the first column, 75 per cent. in the second column and 30 per cent. in the third. That showed a defective power of attention and concentration. Other girls got only 30 per cent. right in the first column, but improved as they went on, reaching in some cases 98 per cent. correct in the last column. This indicated an aptitude for application.

Professor Muensterberg performed several other psychological experiments. At the end of six months the results obtained by him will be compared with the ordinary reports of the telephone managers concerning the new girls on probation. If the psychological tests and the ordinary reports agree substantially in their conclusions it will appear that the Professor has found a simple way of selecting efficient "hello girls."

Professor Muensterberg is a great believer in the psychological value and uses of the telephone.

"I have even hypnotized over the telephone," he says.

It appears that when a person has resisted hypnotism applied by the operator directly it may be possible to hypnotize him by a suggestion conveyed over the telephone in a manner to take the subject off his guard. If Professor Muensterberg could hypnotize persons over the telephone, how much more effectively could a "hello girl" with a nice voice do it.

Contrary to the older theory of animal magnetism, personal contact is entirely unnecessary for hypnotism, and the mere suggestion, conveyed by writing or by telephone, is sufficient to induce hypnosis. Professor Pierre Janet, of the University of Paris, hypnotized Madame B. by telephone and induced her in a hypnotic trance to leave her house in a distant part of the city of Havre and go to the house of Dr. Gibert. Out of a series of twenty-five experiments nineteen were successful.

Now these experiments have a most important relation to those carried out upon the "hello girls" at Cambridge. One of the most interesting facts brought out by the Cambridge experiments was that Cupid was the most serious factor in upsetting the mental processes of the girls. Not only was their attention distracted by sentimental affairs already in their minds, but the voices of strange men having a certain emotional affinity for them heard over the telephone for the first time, exercised an extremely perturbing influence upon them.

The average telephone girl only stays in the service three years, matrimony being the cause of her leaving in 90 per cent. of cases. During all this period the girl has her mind more or less on the possible man of her choice and to that extent her attention may be distracted from the calls of the public. There are, of course, many girls who can have an engagement and yet answer calls efficiently.

When a man gets married it usually intensifies his interest in his work, but with a woman even the prospect of this event commonly ends all thoughts of work. For many reasons the "hello girls" are especially desirable as wives and this helps to derange the service.

Before starting work they must pass an examination, showing that they possess good health, intelligence and general capacity. They are usually gifted physically, as they are required to be ambidextrous. For instance, they are called upon to use both hands with equal facility in handling the plugs of the switchboard. This training fits them to hold a baby and handle a carpet sweeper at one and the same time.

Very frequently a man becomes interested in a girl simply through hearing her voice over the telephone. Experiments have shown clearly that there is something peculiarly fascinating to a man in a nice girl's voice heard over the telephone. He hears the voice, but does not see the girl, and imagination comes into play.

If a girl is good natured, a man can tell it as a rule by the inflection of her voice over the telephone and also by the character of her reply to a remark. Thus the telephone ompany is robbed of its most agreeable employes by Cupid.

As the girl can exercise so much influence upon men by her voice over the telephone, it follows that the men possess a similar power. The truth of this was established by experiment.

A vigorous young man of thirty, of quick mind, agreeable manners and strong vitality was instructed to call up the exchange and ask a question requiring more than the usual amount of attention. The girls were, of course, ignorant that any such experiment was being made. A scientific observer was present in the exchange to note the result of the experiment.

"Please call 3200 Chelsea and give a good, long ring, be-

(*Continued on page 144.*)

In the Rural Line Districts

Charles Blair, the telephone enthusiast, has just completed a new line to Blue River. It is a through line without any phone loading. Boscobel will know now that Blue River is on the map.—Boscobel Item, Fennimore (Wis.) Times.

The new telephone building is practically completed and unless something unforeseen happens, Elmwood will have six grocery stores in a week or so.—Elmwood (Ill.) Gazette.

H. H. Bunch and wife were Burlington goers Saturday. Mr. Bunch expects to start with a gang of men this week to build a telephone line, starting at Keokuk.—Pontoosuc Item, Carthage (Ill.) **Republican.**

Mrs. Emma Phillips has been secured by the directors of the telephone company to manage the central and keep the system in repair. She has secured Ed Williams to act as lineman.—Bunker Hill News, Salina (Kans.) Journal.

Some people seem to want to hit the Mutual Telephone here a lick, but all of the members were willing to sell and no one made much of a loss. Of course a few things were done, not according to law, but it was through not understanding a few things and no one was taken advantage of. Clarence McKay is building up a fine system. Most of the old patrons will keep their boxes. The service is good.—Port William Item, Xenia (O.) Gazette.

Workmen began work yesterday to string an extra telephone line from Kaukauna to Freedom to connect up a large number of new subscribers.—South Kaukauna (Wis.) Sun.

A new telephone exchange has been installed here. It will be operated by Mrs. W. H. Brickey.—McQuady Correspondence, Cloverport (Ky.) News.

The Trowbridge telephone company have the lines up for the new route. They will place the phones this week.—Shelby Item, Neoga, (Ill.) News.

Work has already begun on the telephone line and in a short time nearly all the farmers here will have telephones installed in their homes.—Maplewood News, Sturgeon Bay (Wis.) Democrat.

W. Y. Brown and family have moved from the telephone exchange building in Barneston, to a farm. A family from Pawnee has taken charge of the exchange.—Wymore (Neb.) Wymorean.

O. K. Telephone Company have received a car load of poles to be used in the near future in rebuilding and repairing their lines.—Payson (Ill.) Times.

Roy Montgomery is putting in a private telephone line to his ranch, two and one-half miles south of this city.—Gillette (Wyo.) News.

Floyd McCallister has sold his interest in the Farmers Telephone line to J. H. Wells who will place a phone in his blacksmith shop.—Rockport (Ill.) Item, Hannibal (Mo.) Post.

HEY! GIT OUT O THAT DINNER BASKET WE DON'T EAT TILL WE GIT TO MAFFET'S GROVE
I HAULED PRESIDENT TAFT IN THIS BAND WAGON ONCE
GOLLY! THAT CHICKEN DOES LOOK GOOD
GET UP YOUR UMBRELLAS GIRLS ITS BEGINNING TO RAIN
REALLY?
GIMME A WING MERT WILL YOU?
OH THANKS ED, AREN'T THEY JUST TOO SWEET
HERE SOPHIE, TAKE THESE AND I'LL GATHER SOME MORE UP THE ROAD A PIECE
Brandenburg.

The telephone company employees had their annual picnic arranged for last Friday and threatening clouds in the morning were laughed to scorn by the jolly crowd that piled into Senescall's band wagon. They rendezvoused in Will Maffet's grove at Lake Hook and "showed as advertised," despite the weather. This is the company's fifth annual outing, four of which were on rainy days. The party was made up as follows: Manager Clay, Mrs. Laura Madson, Albert Evans and wife, Misses Sophie Erickson, Minnie Olson, Myrtle Maffet, Olive Nelson and Marie Therkelson and Ed McMullen.—Hutchinson (Minn.) Leader.

They Seldom "Come Back"

and it really surprises no one.

A No. 10 B & S *copper* wire with a breaking weight of 489 pounds has an elastic limit of ONLY 160 POUNDS, and after being subjected to a load beyond its elastic limit does not return to its original tautness. It will retain the sag caused by the stretching and grow worse under each additional strain until it finally breaks. In other words, IT DOESN'T "COME BACK."

Compare this with No. 12 B & S Copper Clad, which has a breaking weight of 510 pounds and an elastic limit of 250 pounds.

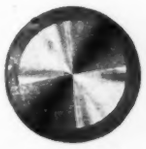
Its smaller diameter prevents the accumulation of as heavy a sleet load as the No. 10 copper, its decreased weight is easier on your poles and cross arms, while its mechanical superiority insures a line that's in service ALL THE TIME.

Trade-Mark "Weld Clad"

IT DOES "COME BACK" AND ITS COST PER MILE IS BUT ONE-HALF THAT OF THE No. 10 COPPER

DUPLEX METALS COMPANY

CHICAGO OFFICE 853 Peoples Gas Building — Chester, Penna. — NEW YORK OFFICE 30 Church Street



Trade-Mark "Weld Clad"

INTERESTING NOTES ON CONDENSERS

In the early days of telephony, Condensers were invariably built up from solid tin foil and waxed paper. Such Condensers are, however, apt to break down and become crossed or short-circuited, especially under modern conditions.

A grit in the foil or a pin-hole in the paper is sufficient to cause a breakdown, and the defect can seldom be made good because the two foils become welded together by the current passing through the fault. Occasionally the weld can be burnt out by a strong current, but this generally damages the Condenser seriously, because the solid foil is of appreciable thickness and requires a heavy current to fuse it.

The minimum thickness of foil commercially usable is determined partly by the high cost of rolling the metal, and partly by the difficulty of handling extremely thin foil. Consequently, the foil commercially used is much thicker than is called for by the electrical conditions.

The ideal conditions of an extremely light and thin film of metal, combined with considerable mechanical strength, seem therefore to be impossible of attainment; but, nevertheless, the apparently impossible actually has been attained, and as the result, the manufacture of Condensers is being revolutionized.

The solution of the problem was found by the English telephone engineer, G. F. Mansbridge, who conceived the idea of employing for Condenser work a specially prepared metallized paper, i. e., a paper upon which is deposited an extremely thin film of pure tin, forming an even and continuous conducting layer in absolute contact with, and inseparable from, the paper.

In this combination, the paper provides the necessary mechanical strength, and the thin film of tin the conducting electrode. The thickness of this film is such that, whereas there is ample conductivity for all telephonic currents, there is so little mechanical strength **in the film alone** that it instantaneously shrivels up if subjected to currents greatly in excess of its normal carrying capacity.

This property of shriveling up under excessive current is of great value, since a Condenser made from such material (known generally as a **MANSBRIDGE CONDENSER**) is rendered absolutely proof against breakdown from internal crossing or short-circuiting. If an internal short-circuit be accidentally or purposely produced, the Condenser at once begins to discharge itself across the point of short-circuit and the momentary current concentrated at this point is strong enough to shrivel up the conducting film **immediately surrou**nding the point.

By this **localized** shriveling up, the film isolates itself from the point of breakdown, and the insulation of the Condenser is preserved, since the heat developed by the transient current is insufficient to scorch the paper.

This automatic sealing of the breakdown point may be repeated thousands of times, and still the Condenser will retain its capacity and its insulation.

So instantaneous is the sealing that, if a pin be driven into an insulated charged **MANSBRIDGE CONDENSER** so as to cause a short-circuit between the electrodes, the rush of current to the puncture will seal up the defect before the Condenser has had time to do more than partly discharge itself. A dozen or more such punctures may be made before the Condenser becomes discharged.

Just as a **MANSBRIDGE CONDENSER** seals up when punctured by a pin, so does it seal up, automatically and instantaneously, when the puncture is due to a lightning discharge or other high tension current; and it is because of this remarkable and permanent immunity from breakdown that the Condenser was named **by its users** the **MANSBRIDGE DREADNOUGHT CONDENSER.**

Besides possessing this valuable and unique property of automatic sealing, **MANSBRIDGE CONDENSERS** are cheaper, smaller and lighter than those made from solid foil; and they consequently are forcing their way to the front and becoming **the accepted standard everywhere.**

They have been adopted exclusively by the English government Telegraph and Telephone Administrations; and they are made under license by Western Electric Company, L. M. Ericsson Co., Electric Specialty Co., Stromberg-Carlson Co., American Electric Telephone Co., and by numerous other licensees all over the world.

Insist upon having MANSBRIDGE CONDENSERS and save money in first cost, and also in maintenance.

For further particulars and for terms of manufacturing license in U. S. A. and Canada apply:

G. F. MANSBRIDGE, Mount House, New Barnet, England

RATES BASED ON SYSTEM AS A WHOLE.

(*Continued from page 127.*)

provided only for a limited urban traffic, today engineers and builds its plant with a view to an interurban service, either provided by itself or by some other company. Double tracks are provided for, heavy rails are used, ballasting is well done, terminals are provided for, and its lines are so laid out as to make it possible either to extend to outside territory or meet with others who built it up.

All this means that there cannot properly be such a thing as a plant for local service only. The property cannot be separated so as to indicate just that part which is necessary for local and for interurban service, as each one is a necessary part of the whole. It cannot be said either, that they can be separated but that one may be more important than the other, because in the light of experience and present day development, it cannot be imagined that either could stand without the other.

We cannot imagine a telephone plant which would be built for local service alone. If we were asked to provide a subscriber with equipment designed for local service only, we could not serve him, as all equipment used is designed, built up and associated so as to make all classes of service possible, and it is impossible to say just what part is chargeable to each class of service. Yet if the separation between exchange property and toll property is to be made, we must charge the exchange property with the portion of the investment in these facilities which is only its own and the toll with its own.

How can this division be made when it is considered that the toll service is possible only because of the exchange and vice versa? Each is dependent upon the other and each part of the plant is constructed and maintained only because of the other and for service only in connection with the other, both being necessary to make up the whole, and without the whole there would be nothing.

It cannot be said either, that this combination of property is a joint occupation, as the relation between the two is not that one is providing some accommodation to the other, neither is it a by-product of the other nor an accident to it; each is a part going to make up a whole and each is only possible because of the other.

How Are Facilities to be Divided?

The subscribers in each exchange are, of course important to that exchange, but they are as well an important part of the whole system. Suppose a subscriber in the Chicago exchange calls from his station for a subscriber in the Joliet exchange. The connection is completed and an unbroken line of communication is established between the Chicago telephone and the Joliet telephone. What part of the facilities used in this connection are Chicago facilities? What part toll facilities? And what part Joliet facilities? How can they be so divided as to charge each of the exchanges only the proportion of investment or expenses which are strictly local, and then what part of the investment is to be charged as toll and what part of the expense is toll expense?

Exchange lines, exchange switchboards, trunk lines, toll switchboards, cable, poles, conduit toll wires, rural lines, all go to make up a telephone property. These facilities are used sometimes for local communications and sometimes for rural service and sometimes for long distance service, and all the different parts of the property are so constructed and associated as to make any of it available for any class of service. As a matter of fact then, are not all facilities for telephone service just telephone facilities sometimes used for service within an exchange, sometimes for service beyond? Is not the plant just a telephone plant accommodating equipment which can be used either locally or for long distance service? And is it not illogical and improper to attempt to separate the property so as to show it as exchange, toll, rural, etc.?

The interdependence between exchanges must be recognized as a fact. It may be said that in sparsely settled communities the dependence of one community upon another is not as great as in more thickly settled territories, but it must be remembered that all commercial development of all communities is going on at a rapid pace and the territory that is today sparsely settled, tomorrow will be thickly settled, and if there is any difference in the dependence of one upon the other, it is only in degree and not in fact.

A telephone property cannot be separated to conform to its different classes of service within a given exchange, nor between the exchanges themselves, nor between the exchange and the so-called toll property, for the purpose of determining an investment on which rates can be based. It is a property as a whole, and in considering rates for any or all classes of service the operation of the company as a whole must be taken into account, its total investment, total expense and total revenue; and the reasonableness of a particular rate must depend upon the net earnings of the utility as a whole and the value of the particular service as determined by comparison with rates ordinarily charged for similar and other classes of service.

Des Moines Editor on Monopoly and Competition.

Discussing editorially the proposed establishment of a competing plant in Des Moines, the Des Moines Capital says:

> It is significant that when the telephone patrons at Sioux City were asked to state their preference between an automatic and switchboard system, the vote was strongly for the former. Just at present there is agitation in Des Moines for an automatic service. If the Sioux City referendum vote is any criterion, Des Moines patrons need not doubt that the automatic system will be in every way satisfactory.
>
> Sioux City, however, is about to undergo a consolidation such as Des Moines underwent some years ago and from which this city is still suffering. In many respects one telephone system is an improvement over two, but when it comes down to the actual question of service, it is to be doubted whether this city has been the gainer. The removal of competition has apparently worked to the detriment of the patrons. There are more complaints today over delays in getting connections, in suffering "cut offs" in the midst of conversation and in poor service generally than ever existed when Des Moines had two telephone systems. The Capital believes these delays are the fault of the Iowa Telephone Co. It believes that the officials have deliberately planned a reduction of expenses in the city which has resulted in second-class service.
>
> If Sioux City will suffer from such service under one system as Des Moines is receiving since the consolidation, the people of that town will be deserving of sympathy. But if the one system there is to be of the automatic variety, it may be that Sioux City will escape the telephone evils which have been inflicted upon the long-suffering public at Des Moines.

Des Moines underwent, a few years ago, a consolidation of the two telephone systems in that city, the Bell buying the Mutual Independent.

Permission Is Given to Merge in Pasadena.

The California Railroad Commission has granted permission for the merging of the two telephone companies in Pasadena. These three conditions are imposed, however:

That toll service for long distance calls be maintained over both lines.

That the highest standard of efficiency be kept.

That the sale of the Home Telephone Co. to the Pacific Telephone & Telegraph Co. shall be subject to the ratification of the voters of the city of Pasadena. The matter will probably be placed before the voters of Pasadena at the next election.

Veeder COUNTERS
For Telephone Switchboards

¶ When you desire to take the count of the calls the operator answers, a Veeder Counter is necessary.

¶ Get a counter that can be depended upon at all times. You can make no mistake in selecting the Veeder.

¶ Write for catalogue which gives a complete description.

THE VEEDER MFG. CO.
11 Sargeant St. Hartford, Conn
Makers of Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Fine Castings.

Make Better Overhead Work

with the help of the Never Slip Grip.

It grips the wire or strand so it can't slip out, and when the pull is increased it becomes wedged tighter into the Never Slip Grip.

Where Never Slip Grips have been used, you will find that overhead work is all O. K. and that there has been no time wasted in replacing wire in a grip that did not hold.

Learn more about the Never Slip Grip.
Ask any live jobber, or write us.

Union Electric Mfg. Co.
Pekin, Ill.

TRADE MARK REGISTERED 1900

Battery Economy-

¶ The 1900 Battery is the achievement of Mr. Philip Nungesser who designed it over 20 years ago and who since has improved it until it is *battery perfection.*

¶ Every company using it is sure of battery economy—Mr. Nungesser has succeeded in embodying in it the highest amount of electrical energy.

¶ In many exchanges 1900 Batteries are giving 4 months to 4 years longer service than the next best cell. If you want "Battery Economy",—specify 1900 of your jobber —or of us, providing he is out of them.

THE NUNGESSER CARBON & BATTERY CO.
2500 KING AVE., N. E.
Cleveland, Ohio

TRADE MARK REGISTERED 1900

that of the charging generator, the reverse current resulting will operate the switch and open the circuit.

In ordinary cases, the voltage of the charging generator should at first be about 5 per cent. higher than the normal voltage of the battery; as the charging process continues, the back electromotive force of the cells will increase and necessitate a raise in the charging pressure in order to maintain a constant charging current.

The length of time necessary to complete a charge depends upon the strength of the charging current, being greater as the strength of the current is less; the strength of the proper charging current and also of the proper current at discharge, depends in turn upon the capacity of the cell in use. The capacity of a storage battery cell is expressed in ampere hours, and is governed by the design of the plates or elements used in its construction.

The usual charging rate is about 8 amperes per square foot of total surface of the positive plates; this value, together with those of the discharge and capacity of any given type of storage cell can be obtained accurately from the manufacturers. Upon the completion of a charge, the electromotive force of each cell will be 2.5 volts and the specific gravity ceases to rise; the generator may then be disconnected from the cells, and the battery is ready for service. The capacity of the cell in ampere hours may be found by multiplying the charging rate as given by the manufacturer by eight.

THE TERMINAL ROOM.

The terminal room should be kept clean at all times. All old jumper wires should be taken out at the time the line is released. As far as possible, no jumpers should be spliced. All connections should be soldered. When heat coils or fuses blow, they should be replaced by heat coils of same type and fuses of same type and amperage.

Suitable apparatus should be available for making tests of all kinds and this should always be in a state of readiness to meet any emergency. Proper and sufficient fire protection should be provided in the form of sand and asbestos or wool blankets, one dry powder and one chemical fire extinguisher should also be provided. It is considered good practice to use flameproof wire for all jumpers both on main and intermediate frames.

PSYCHOLOGICAL STUDY OF OPERATORS

(Continued from page 139.)

cause the party is likely to be upstairs," said the young man.

"Yes, sir," said the operator with a bright-eyed, cheerful expression.

An elderly man, with a querulous voice and a feeble constitution, was then instructed to call up the exchange and ask certain questions.

"Give me 2901 Brookline and tell them to put Mrs. Jones on the phone. Don't want to speak to anybody else," said the old man.

"We don't deliver messages," replied the operator, with a distinct note of weariness in her voice, as she cut off the inquirer.

Experiments along this line were repeated 200 times and in 75 per cent. of the cases similar results were obtained. A further very curious result was obtained from a continuation of these experiments. The subsequent behavior of the operators who had responded cheerfully to the young man's calls was observed during the day. It was noted that in 35 per cent. of these cases there was a marked degree of inattention, as compared with the ordinary behavior of the subject, indicating that a train of thought had been set up which interfered with the ordinary work.

The conclusion was inevitable that this train of thought was of an emotional or sentimental character, in view of the fact that matrimony calls every girl from the service in an average period of three years.

It was made evident by these experiments that the transmission of the voice over the telephone is much more than a mechanical conveyance of the sound. It is also very different from the conveyance of the same message by writing or some other purely mechanical agency. In many cases the persuasive effect of a voice over the telephone was greater than when the speaker spoke the words directly.

It was possible for an experimenter with quick motor reactions and good powers of observation to tell many remarkable facts concerning an unknown person at the other end of the wire. In nine cases out of ten he could tell whether a woman at the other end of the wire was fully dressed or not.

When she was not fully dressed there was a broken quality to the voice, denoting probably embarrassment, and slight interruptions due no doubt to the instinctive action of placing her hand to her neck to draw her wrapper together.

THE WIRING OF LARGE OFFICE BUILDINGS

(Continued from page 134.)

thought that direct service will be required. The allowance made for direct line service depends upon the neighborhood. The wires to the various apartments are extended up through the dumb-waiter shafts from the terminals in the basement as service is required.

In come cases these buildings are wired in advance by forming the wires into a cable and taping the cable to protect it against mechanical injury, one or two pairs being brought out at each apartment.

Fig. 7 illustrates the case of a six-story apartment building having eight apartments to a floor. The wiring diagram shows the cable distribution in the basement to terminals at the foot of the dumb-waiter shafts.

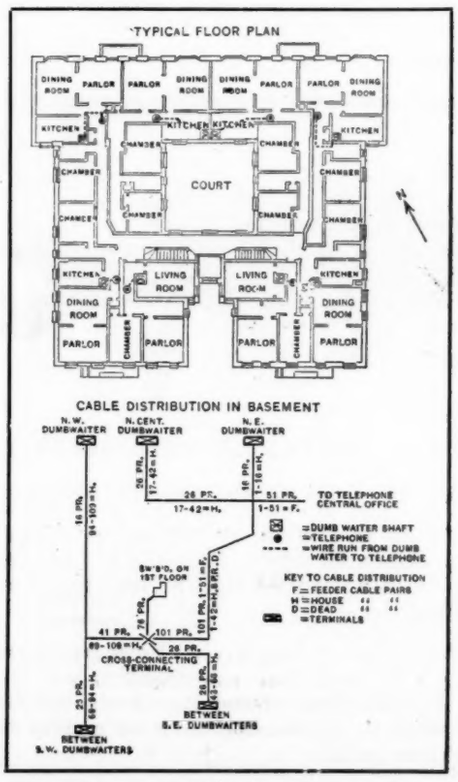
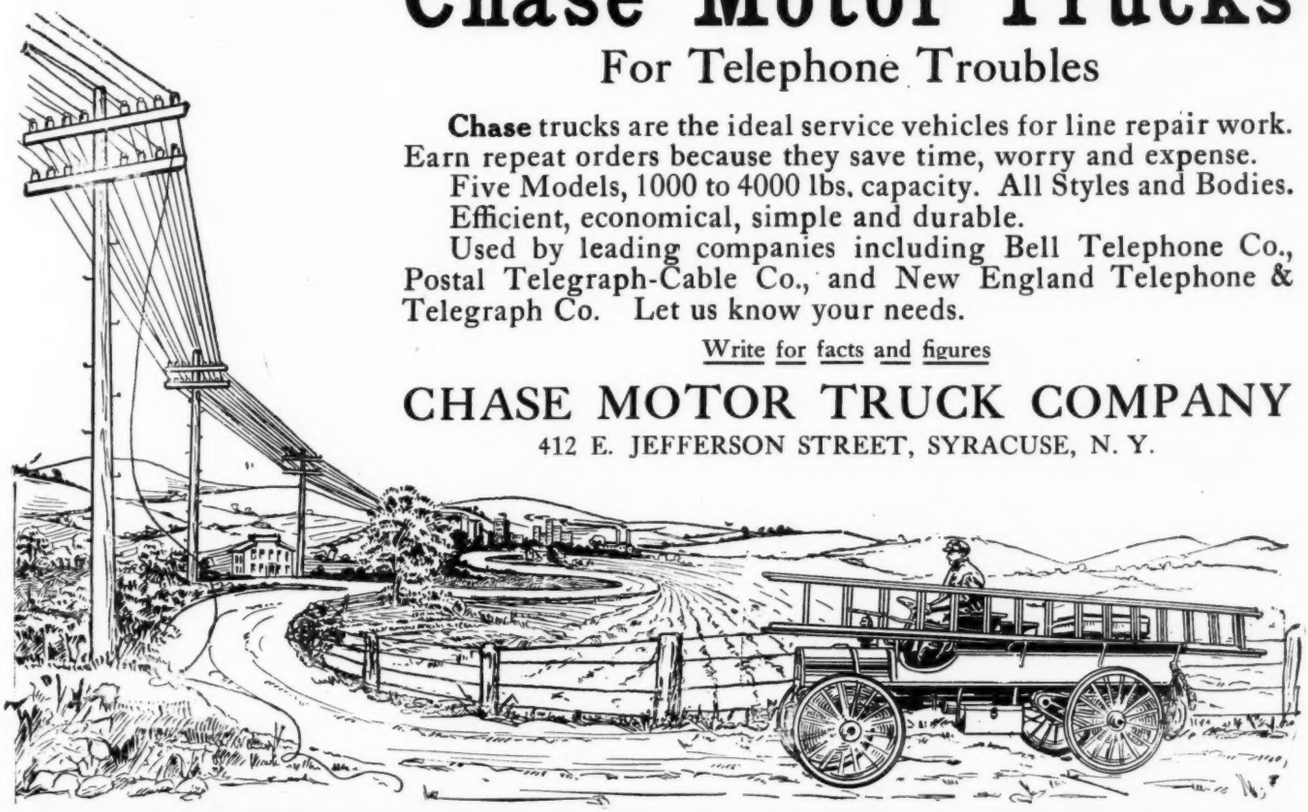


Fig. 8. Wiring for Six-Story Non-Elevator Apartment.

The author wishes to acknowledge the valuable assistance of E. S. Worden and W. A. Taylor in preparing the illustrative examples of this paper.

Chase Motor Trucks

For Telephone Troubles



Chase trucks are the ideal service vehicles for line repair work. Earn repeat orders because they save time, worry and expense.

Five Models, 1000 to 4000 lbs. capacity. All Styles and Bodies.

Efficient, economical, simple and durable.

Used by leading companies including Bell Telephone Co., Postal Telegraph-Cable Co., and New England Telephone & Telegraph Co. Let us know your needs.

Write for facts and figures

CHASE MOTOR TRUCK COMPANY

412 E. JEFFERSON STREET, SYRACUSE, N. Y.

30 to 40 miles in a forenoon

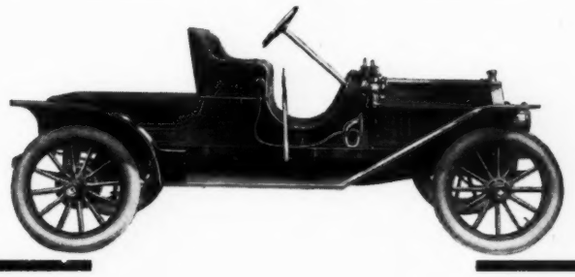
When clearing trouble with a McIntyre Truck

It makes this at much less expense than a horse can and over roads that a horse could not pull your loads.

Enough tools and materials to do the work right can always be carried when a McIntyre truck is used.

There are hundreds of McIntyre trucks adding to the profits of telephone companies—learn the many reasons.

W. H. McINTYRE CO.
AUBURN, IND.



To get to the place of trouble quickly, with the least expense and annoyance use the

Schacht

Unlike a horse it is an expense to you only when in actual use. Pneumatic tires enables the Schacht to travel rough gravel roads with the least jar. Can also be used for recreation—additional seats may be added in rear converting trouble car into touring car.

PRICE $850

Special Discounts are now offered telephone companies. Write for them.

SCHACHT MOTOR CAR CO.,
2734 Spring Grove Ave., Cincinnati, O.

From Factory and Salesroom

Automatic Equipment for Cordoba, South America.

The Automatic Electric Co., of Chicago, is in receipt of an order for automatic telephone equipment to be installed in the telephone exchange at Cordoba, Argentina, South America. This installation is to be made for the United River Plate Co. The order comes through the Automatic Telephone Mfg. Co., Ltd., Liverpool, England, in which company the Automatic Electric Co. is largely interested and which has the sale of apparatus in Latin American countries under its jurisdiction.

The Cordoba order provides for an immediate installation of 1,500 lines of central office equipment with an ultimate capacity of 10,000 lines. The apparatus is to be arranged for individual line unlimited service only, no party line or measured service being contemplated at this time.

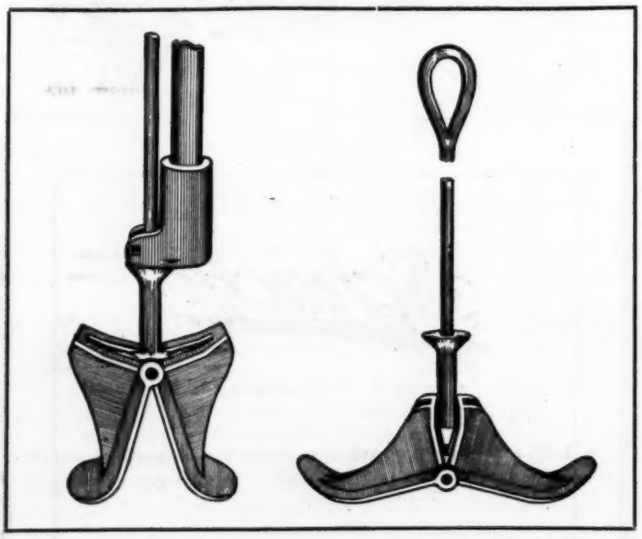
Cordoba is a prosperous city located in the central part of Argentina and has a population of 60,000.

The Clam Shell Anchor.

The clam shell anchor is a new type of anchor recently invented by the Miller Anchor Co., which has specialized in anchor manufacture for some years. The company advises that this anchor represents the best of its accumulated experience, and states that it will stand a strain which will break the rods before being pulled up. The anchor is substantially made of malleable iron.

The simplicity of the installation of this anchor is one of the features, Mr. Miller advises, which is inducing many telephone managers to seriously consider it for their fall construction. All the preliminary work necessary for installing the anchor is the boring of a hole. When this is done, the anchor is placed at the bottom and the Miller improved tamping bar, which cannot slip off the rod, is then used to push down on the anchor until it is fully expanded. Raising the rod three inches locks the anchor open.

It is claimed that one man can readily, as well as easily, install this anchor in from 15 to 20 minutes. The company

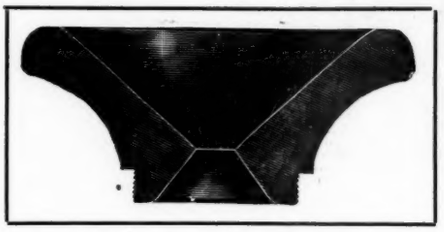


The Clam Shell Anchor Closed and Expanded.

has conducted some interesting as well as severe tests of this new type of anchor for the benefit of many companies, and it is said that the anchor is giving proof that it is very efficient. Literature fully describing the clam shell anchor will be gladly sent by the company upon request.

New Style Telephone Mouthpiece.

An unusually interesting new style of telephone mouthpiece has been patented by S. S. Sonnesborn, assistant general manager of the Electrose Mfg. Co., Brooklyn, N. Y. The features of the new device are both sanitary and economical. On account of its being thick and shallow



The New Type Mouthpiece.

instead of a deep bell-shaped structure with thin walls, it can not easily be broken, nor does it protrude and inflict injuries to the lips or face. Its solid construction also makes it practically indestructible.

Even more important than these economical features, are the sanitary advantages offered by the new style mouthpiece. Being very shallow and with a gradually sloping surface, it can easily be kept free from dirt—in fact, will not catch and retain any fraction of the impurities made possible by the old style attachment. Mr. Sonneborn's device is made to fit any standard transmitter face plate and its construction is such that the transmission is clear and strong. It also is claimed that sound waves conveyed through the new mouthpiece, retain all the natural qualities of the human voice.

The Electrose Manufacturing Co. is ready to furnish free samples, either direct, or through its representatives, The Paragon Sellers Co., of Chicago. Quotations in quantities also will be promptly furnished.

Stromberg-Carlson Business Better Than Ever.

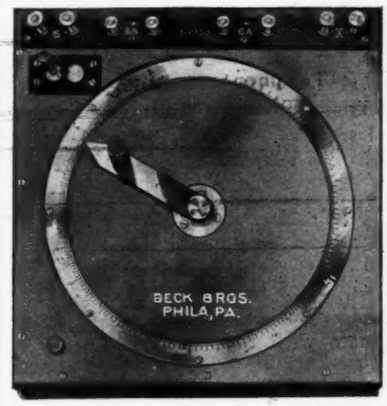
The general switchboard business, of the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., has been better than for some time and telephone sales this month are 40 per cent. ahead of last year. This is even in excess of the business for June, which was not a poor month for the season and in comparison with the same period fot previous years. The company is in a position to make exceptional bargains in some types of telephones which are of the same quality as all Stromberg-Carlson apparatus, and this has been responsible for the general increase in its telephone business.

The following is a list of large common battery installations, the orders for which have been secured recently or since the first of the year. The list is self-explanatory and indicates that the company has been doing a big share of the Independent business o this class:

Peoples Telephone & Telegraph Co., Knoxville, Tenn.; common battery switchboard equipment of 2,100 lines, having features of automatic ringing and listening with distributing call system.

Louisville Home Telephone Co., Louisville, Ky.; installation of new branch exchange, consisting of common battery switchboard equipment, 2,400 lines, six sections of switchboard with 15 equipped positions. Four sections of "B" trunking switchboard with automatic ringing. Complete terminal, power and battery plant equipment in addition.

Plymouth County Telephone Co., Le Mars, Iowa; com-



Direct Reading Capacity

and

Conductor Resistance Bridge

This is a Very Convenient and Reliable Instrument

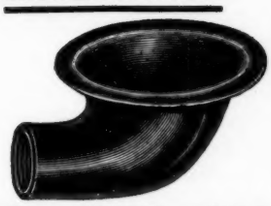
Our Literature Sent Upon Request

BECK BROS., 210 N. 2nd St., Philadelphia, Pa.

TRADE ELECTROSE MARK
REG. U.S. PAT. OFF. & FOREIGN COUNTRIES.

INSULATION
STANDARD OF EXCELLENCE

Sixteen years of Satisfactory Service



Employed by the Foremost
ELECTRICAL MANUFACTURERS OF THE WORLD

Receiver Shells, Mouthpieces, Terminal Strips and Blocks, Jack Panels, Bases, Knobs, Etc.

INSULATING PARTS OF SPECIAL FORM MADE TO ORDER

Sole Manufacturers

ELECTROSE MFG. CO.
Robert Gair Bldg.
Washington and Front Sts., BROOKLYN, N. Y.

PARAGON SELLERS CO., 162 N. 5th Avenue, CHICAGO

The Arrester that is getting the attention—

WHY?

Because it is killing that expense of making long drives over party lines looking for a partially grounded carbon, the trouble that is so often difficult and expensive to locate. This accounts for this arrester finding its way into almost every rebuilding order. The day of lightning trouble is passing. Write for particulars and prices.

Metallic Lightning Arrester Company
Winona, Minnesota

L & N Lineman's Fault Finder

THE LEEDS & NORTHRUP CO.
4901 Stenton Avenue, PHILADELPHIA

¶ The **L. & N. Portable Testing Sets** are convenient instruments for the measurement of resistances and the location of faults. Our Lineman's Fault Finder is a simple, reliable and inexpensive instrument for these purposes. May be used for locating faults, crosses, opens, etc., on telegraph and telephone lines. Also for measuring conductor and insulation resistance.

May we send you details?

Electrical Measuring Instruments

Please tell the Advertiser you saw his Announcement in TELEPHONY.

plete common battery switchboard equipment of 1,000 lines with all local battery subscribers' lines and farmers' lines multiplied in switchboard.

Greenville Home Telephone Co., Greenville, Ohio; central office equipment having 1,350 lines, consisting of three sections of switchboard with 826 positions equipped. Automatic machine ringing and operators' listening cutoff positions.

Zenith Telephone Co., Duluth, Minn.; branch exchange equipment for the new Park office consisting of complete common battery multiple switchboard equipment with terminal, power and battery plant in addition.

Grandville Telephone Co., Grandville, N. Y.; common battery multiple switchboard system of 800 lines with complete terminal, power and battery equipment in addition.

Central Home Telephone Co., Louisville, Ky.; four sections of multiple toll board for the Main exchange in Louisville, Ky.

Moultrie Telephone Co., Moultrie, Ga.; magneto multiple visual signal switchboard equipment with 500 lines installed.

Pike County Telephone Co., Pittsfield, Ill.; common battery multiple switchboard with all equipment for a complete central office equipment.

Peoples' Telephone Co., Chillicothe, Ill.; magneto multiple visual switchboard system with full equipment of 500 lines.

Citizens Telephone Co., Decatur, Ind.; magneto multiple visual switchboard system with 900 lines equipped, complete with storage battery equipment and mercury arc rectifier charging outfit.

New Catalog of Central Electric Company.

The Central Electric Co., Chicago, has just issued a new general catalog of electrical supplies, which is termed the "Silver Anniversary Edition," as it marks the 25th year of the company in the distribution of electrical merchandise and apparatus. It contains over 1100 pages, 7x10 inches in size, and is one of the most complete electrical supply catalogs issued up to the present time.

Practically all appliances and material, useful and necessary in the construction and operation of electrical installation and apparatus of every character, is listed in this book. It presents in a convenient and compact form the latest electrical appliances so that a person has no difficulty in learning what is the most approved apparatus and equipment.

A new feature of the catalog which will strongly appeal to the out-of-town customer is the listing of the approximate weights of the various articles. These weights furnish the purchaser with a very good basis for estimating freight charges. The work bears evidence of unusual care in selection and preparation of the illustrations, of which there are many.

There are but few articles used in telephone work that cannot be found. Everything used in construction work and in the outside plant, such as cross arms, cable, wire, pole cable terminals, insulators and many other supplies, tools, etc., are listed. For inside the exchange, switchboards and telephone sets with the fuses, terminals and other equipment are found.

In the back of the catalog are many tables of useful information. Data which is extremely helpful to all engaged in electrical work is also given. Persons who secure copies of this book are indeed fortunate as it is of great value for reference purposes.

Paragraphs.

The Monarch Telephone Mfg. Co., of Ft. Dodge, Iowa, has been granted permission to do business in Texas. Texas headquarters will be established at Dallas.

The Dean Electric Co., Elyria, Ohio, announces that arrangements have been completed by which Marshall-Davis, Limited, manufacturers of electrical appliances, Dunville, Ontario, have become exclusive Canadian agents for Dean telephone apparatus. In future all Canadian orders will be filled promptly from Dunnville stock.

McRoy Clay Works, Chicago, in its August calendar blotter sets forth the following philosophy: "They say you can never judge the cigar he smokes by the one he gives you! McRoy only offers one grade of conduit, so you will always get the best." The blotter, which is a multiple one, indicates by its appearance that the McRoy standard is a high one.

The Swedish-American Telephone Mfg. Co., of Chicago, has been incorporated, with a capital stock of $60,000, to manufacture and deal in electrical apparatus. The incorporators are Donald L. Morrill, Gertrude Holz and William H. Johnson. The company proposes to continue the business of the former Swedish-American company, which was recently sold by the court.

Legal Cases and Decisions

By A. H. McMillan

Franchise Rights in Pomona.

The Sunset Telephone & Telegraph Co., of Pomona, California, is held by the Supreme Court of the United States to have a grant of the right to keep its main through lines in the street of the city, but not to maintain the posts and wires by which it connects with subscribers. This decision was made in a suit brought by the telephone company to restrain the city from removing its poles and wires from the city streets.

The reason for the decision was that no grant to a telephone company of the right to occupy the city streets without its consent, which will be protected by the contract clause of the federal constitution, could be deduced from the amendment to the constitution of California. Under the amendment persons or corporations might establish and operate works for supplying the inhabitants of a municipality with telephone service "upon such conditions and under such regulations as the municipality may prescribe under its organic law, on condition that the municipal government should have the right to regulate the charges." Pomona vs. Sunset Telephone & Telegraph Co., 32 Supreme Court Reporter, 477.

No Action on Bond When Franchise Did Not Take Effect.

An ordinance was passed by the city of Salem, Oregon, giving Charles E. Sumner a franchise to install and operate a telephone system. It provided that he should within thirty days file a bond for $5,000 on condition that he would within eighteen months have in good working order a telephone system of not less than four hundred automatic telephones. He accepted the franchise, filed the bond and assigned the franchise to the Home Telephone & Telegraph Co. of Portland.

Later the council passed an ordinance giving the Home telephone company the right to extend the time for the completion of the telephone exchange under the franchise to Sumner. This later franchise contained a consent to the assignment of the franchise from the Home telephone company to the Salem Home Telephone & Telegraph Co.,

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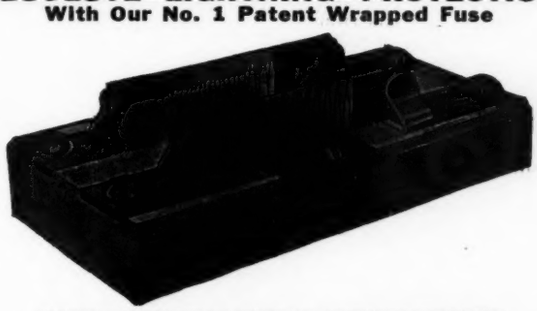

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and provided for the additional bond, until the filing of which the franchise was not to take effect.

A bond was filed by the Home telephone company, but none by the Salem telephone company, and no telephone system was installed. The city commenced action against the Home telephone company on the bond given by it. The Supreme Court of Oregon held that the ordinance did not become effective until the bond required of the proposed Salem Home telephone company should be given. As the ordinance had not become effective, it was held that the city could not recover on the bond given by the Home telephone company. City of Salem vs. Home Telephone & Telegraph Co., 112 Pacific, 290.

Severance of Connection a Breach of Contract.

The severance of a connection by a telephone company whereby a subscriber is deprived of the service to which he is entitled, is a breach of the contract by the company. The company is liable to the subscriber, not merely for general damages, but for such special damages as were the natural and probable result of the special conditions of which the company had notice. Notice of such special conditions need not have been given the telephone company when a contract was made, but it is enough that they were given prior to the breach. So held the Texas Court of Civil Appeals in a suit brought against a telephone company for mental anguish sustained by a man from witnessing the suffering of his wife, occasioned by failure to secure the attendance of a physician on account of severance by the company of the telephone connection of the plaintiff, who was a subscriber. The subscriber had stated to the company's manager at the time he paid his rental that his wife was ill and he was likely to need the telephone to obtain the services of a physician. Southwestern Telegraph & Telephone Co. vs. Allen, 146 Southwestern, 1066.

Ceasing to Use a Pole Ends Responsibility for It.

After a city ceased to use a pole, which it erected and used to support a fire alarm box, and a telegraph company had taken control of it as a guy wire pole, the city is under no greater duty to look ofter the pole then any other pole used by the telegraph company. Hence, the city is not bound to inspect the pole, though the telegraph company did not take possession of it under any agreement with the city. The duty of keeping it in safe condition thereafter is primarily upon the telegraph company. But the city is liable for injuries caused by the falling of the pole in the street, after it knew or should have known of its dangerous condition.

The telegraph company is not required to anticipate that fire hose will be wrapped around the guy post. It is not liable for injuries to a fireman, caused by the falling of the guy post, due to wrapping a fire hose around it, and putting a strain on it by a fire reel ceasing to revolve as the hose was unwound. These are holdings of the Kentucky Court of Appeals in a suit brought against the American District Telegraph Co. by a fireman injured from the falling of a guy wire pole. American District Telegraph Co. vs. Oldham, 146 Southwestern, 764.

Guarding Post Holes.

It is not contributory negligence, as a matter of law, for a mother to allow her children to play in the doorway while a telephone is being put in the house, and the necessary poles are being erected for the purpose. So held the Supreme Court of North Dakota in a case where a child of three and one-half years fell into the post hole and died as a consequence. The company had contracted with a laborer to dig the holes, but this was held to be no lawful excuse, it being the duty of the company to properly guard them. Ruehl vs. Lidgerwood Rural Telephone Co., 135 Northwestern, 793.

Sagging Wire.

An ordinance of the city of Sturgess, Mead county, South Dakota, required all telephone wires to be suspended at least sixteen feet above the level of all streets. While an omnibus driver, seated on the top of his bus, was driving at a moderate trot along the middle of a much traveled street, he was caught in the mouth by a telephone wire, dragged from his seat, and some of his teeth and a portion of his jaw bone torn from his mouth.

The wire sagged between a house and barn on opposite sides of the street. It was attached to the barn about fifteen feet above ground and to the house about twelve feet above ground. There was evidence tending to show that the wire had been in a sagging condition for some months before the accident.

The case was held to warrant a recovery by the plaintiff. Actual notice to the telephone company was not required, it being held that it was sufficient to show that the defect could have been discovered by using ordinary care, or had existed long enough to enable the company to discover it. A verdict of $920 was held to be not excessive. Thompson vs. Reed, 135 Northwestern, 680.

Salary of Manager.

A telephone company hired a manager at $75 per month, but it was understood that he was to receive $100 per month when tried out by the board of directors and found to be satisfactory. No particular time was fixed when the payment of $100 was to begin, and, though it was his duty to bring matters of business before the board, he never presented the question as to when his salary should begin.

At one time he spoke to two of the five directors about bringing the matter before the board and they promised to do so, but did not. One of the directors told him he was entitled to his raise because he had done the work. The company paid him and he gave receipts on the basis of $75 per month, and after being employed eight months sued the company for the additional compensation.

The Supreme Court of Nebraska held that the evidence was insufficient to sustain a finding of the jury that the company had agreed to pay him $100 per month. Carlos vs. Hastings Independent Telephone Co., 136 Northwestern, 345.

Damages to Telephone Lines.

It was shown that materials used in repairing a telephone line damaged by blasting operations, were for the greater part manufactured by only a few concerns; that they had no general or fixed market value; that the manufacturer's prices varied from time to time as the market price of copper and lead varied; and that the prices at which the telephone company valued them were the current going prices of the concerns handling them or like articles at the time they were used in making the repairs. Evidence to that effect was held sufficient to show the reasonable value of the materials in an action brought by a telephone company against the concern which was responsible for damaging the line by blasting in the neighborhood. Pacific Telephone & Telegraph Co. vs. Huetter, 122 Pacific, 607.

Liability of Pole Inspector.

A pole inspector, who is negligent in failing to discover a defect in a pole, is jointly liable with the telegraph company for injuries to a lineman caused by such defect. Where the rules of the company require a lineman to inspect poles before climbing, and they also employ an inspector to examine the poles, the lineman does not assume the entire responsibility of inspection.

These are some of the holdings of the Supreme Court of South Carolina in a recent case brought against the Postal Telegraph-Cable Co. for injury to one of its employes. Jones vs. Postal Telegraph-Cable Co., 74 Southeastern, 492.

Unlimited Corporate Existence.

In 1886 the Kentucky legislature chartered the Ohio Valley Telephone Co., fixing no limit to its corporate existence. The principal office of the company was to be at Louisville, but it was empowered to construct and maintain, within the state and elsewhere, telephone lines and exchanges, and authorized to acquire and dispose of license rights and franchises relating to its business. The city of Louisville, conformably to the charter of the telephone company, assented to the company constructing and maintaining a telephone system in the city.

Differences having arisen between the company and the city in 1908, the city passed an ordinance revoking the franchise of the company. The company brought suit to enjoin the enforcement of this municipal ordinance and the case finally reached the supreme court of the United States, which sustained the decree of courts below, restraining the enforcement of the ordinance. The supreme court held that the assent of the municipality, when once given, perfected the company's franchise. It, being a legislative grant, could not thereafter be repealed, nullified or forfeited by municipal ordinance. City of Louisville vs. Cumberland Telephone & Telegraph Co., 32 Supreme Court Reporter, 572.

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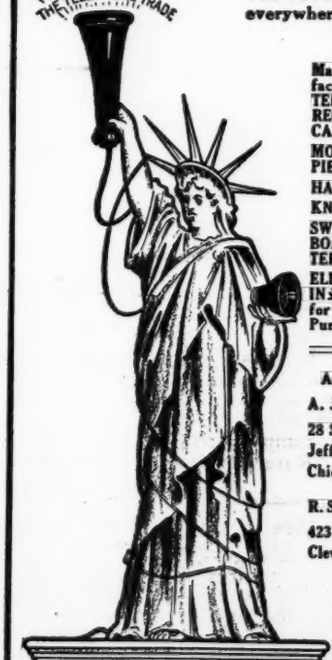

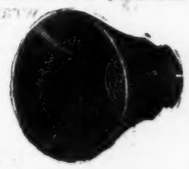

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Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

FRANK B. COOK, of Chicago, has returned to his office after ten days' motor trip through Ohio, Indiana and Michigan.

C. C. CAMPBELL, district manager of the Mountain States Telephone & Telegraph Co., at Cheyenne, Wyo., has been appointed special representative of President E. B. Field, in the general offices of the company in Denver.

F. E. REIFF, of Detroit Mich., has been appointed manager for the Michigan State Telephone Co., at Houghton, Mich., succeeding R. T. White. Mr. White has been transferred to the Grand Rapids district as special agent.

W. H. YOUNG, who for the last three years has been local manager of the Helena Automatic Telephone Co., Helena, Mont., has resigned his position. R. G. Richardson, the present plant superintendent, has been appointed to succeed Mr. Young.

CHARLES J. MILLER, chief clerk to the contract superintendent of the Kansas City Home Telephone Co., Kansas City, Mo., was in Chicago recently on a vacation trip. He visited TELEPHONY's offices while there and expressed himself as thoroughly satisfied with the outlook for business this fall.

Obituary.

D. Y. MILLIGAN, founder of the Shelby County Mutual Telephone Co., died recently at his home near Shelbyville, Illinois.

HARRY M. TORRANCE, district manager for the Nephi district of the Mountain States Telephone & Telegraph Co., Salt Lake City, Utah, died suddenly there.

NICHOLAS YOUNG, superintendent of the Massachusetts Telephone & Telegraph Co., at Taunton, Mass., and a former member of the common council, died in a Boston hospital following an operation. He was fifty-nine years of age.

New Companies.

COTTER, ARK.—Articles of incorporation have been filed by the Arkansas-Missouri Telephone Co., with $25,000 capital stock. The incorporators are: E. A. Farris, president; David A. Gates, vice-president; D. F. Bradshaw, secretary and treasurer, all of Little Rock.

THOMASTON, GA.—The Thomaston Telephone Co. has been organized with $10,000 capital stock. The incorporators are R. A. Fincher, president and general manager; H. D. and W. T. Fincher, Culloden; J. J. Fincher, Yatesville; O. S. Fincher, Roberta. The company will construct a line from Thomaston to Yatesville, Culloden and Roberta.

NEALY, KY.—The Nealy Independent Telephone Co. has been organized to build a system in Nealy, with $1,000 capital stock. G. W. Nealy is manager.

VIPER, KY.—The Viper Telephone Co. has been organized by H. J. Hall and others with a capital of $900, to build a line in Viper and surrounding sections.

HALMA, MINN.—The Forest Lea Co-operative Telephone Co. has been organized by farmers in this vicinity.

DE KALB, N. Y.—The Maple Ridge Rural Telephone Co. has been incorporated, capital stock $3,000. The directors are: Ervin Streeter, Horace F. Streeter, Donald H. Ritchie, Frank B. Williams, Grovenor T. Conant, Albert Roach and George Gilson, all of De Kalb.

HEUVELTON, N. Y.—The Heuvelton Telephone Co. has been incorporated here with a capital of $25,000. It will operate in St. Lawrence county. The directors include: Webster L. and Naomi M. Wainwright, Heuvelton, and S. M. Wainwright.

ABERDEEN, S. D.—Articles of incorporation have been filed by the Farmers' Automatic Telephone Co., with $10,000 capital stock. The incorporators are: E. E. Granger, J. L. W. Zietlow, S. H. Collins and E. Oderkirk.

ROBY, TEXAS.—The Orient Telephone Co. has been organized, with headquarters in Roby.

NILES, WASH.—The Nile Telephone Co. has been incorporated by A. R. Abel, G. W. Johnson and James A. Beck.

Construction.

SAYBROOK, ILL.—The village board has granted a twenty-five year franchise to Coon Bros. to construct and operate a toll and farm line in this village.

BARNUM, MINN.—The Farmers' Independent Telephone Co. is stringing lines to Wahtowa to take in the Park Lake and Sandy Lake territory.

PRATTSBURG, N. Y.—The Prattsburg Overland Telephone Co. has an agreement with the Prattsburg & Kanona Telephone Co., of Kanona, N. Y., which provides for the rural development by the latter company in the vicinity of Kanona. This development will practically cover all of the highways leading to that village. All of the old lines will be made metallic and the new construction will be up-to-date in every particular.

PORT ARTHUR, TEXAS.—The South Texas Telephone Co. contemplates new construction here. The cost of the work will be approximately $20,000.

BRUCE, WIS.—The Murray Telephone Co. will extend its lines in this territory.

Financial.

HENRY, ILL.—The Henry Telephone Co. has filed an amendment to its charter increasing its capital stock from $2,500 to $40,000.

JACKSON, KY.—The Jackson Home Telephone Co. has increased its capital stock from $5,000 to $7,000 and will make some extensions. New lines will be constructed from Jackson to Hindman, a distance of 40 miles.

NORTH JACKSON, OHIO.—The North Jackson Telephone Co. has increased its capital stock from $10,000 to $25,000.

MONROE, WIS.—The Union Telephone Co. has authorized a bond issue of $40,000.

Elections.

STEVENSVILLE, MONT.—At a recent meeting of the stockholders of the Burnt Fork Rural Telephone Co. the following officers and directors were elected: C. B. Calkins, president; A. C. Williams, vice-president; Will Buck, treasurer; B. Parnall, secretary.

DELPHI, N. Y.—The newly elected officers of the Dingle Hill Telephone Co. are: Henry Deitrich, president; Charles R. Tremper, vice-president; A. A. Glendenning, secretary and treasurer; L. H. Shafer, business manager.

MT. BLANCHARD, OHIO.—After declaring a dividend of 4 per cent., the following officers were elected for the People's Telephone Co.: B. F. Seitz, president; Mrs. Nora Sampson, secretary, and Oscar Wise, general manager.

NORDEN, S. D.—The Hamlin County Farmers' Telephone Co. has held its annual meeting and elected the following directors: Robert Chamber, J. A. Wilson, Martin Korstenen, G. Sunderson and P. O. Swanson.

Miscellaneous.

ALBANY, ILL.—The Albany Telephone Co. has purchased the James Beach property and will begin remodeling it for its office and storage room and for the residence of the new manager, Frank McNally, of Des Moines, Iowa.

GIRARD, KANS.—Geo. W. Crawford, of this city, has bought the Cherokee telephone exchange.

OWOSSO, MICH.—The Union Telephone Co. has announced that it will expend several hundred dollars in improving the service at Durand. The entire open wire system in the village will be cabled and other extensive improvements are planned.

FRANKLIN, OKLA.—I. E. Montgomery has sold all the stock that he carried in the Republican Valley Telephone Co. to Dr. H. M. Ochiltree, of Haddam, Kansas.

SUPPLY, OKLA.—The Fort Supply Telephone Co. has changed its name to Fort Supply Telephone & Telegraph Co.

READING, PA.—Three hundred telephone lines in Reading and vicinity were burned out by an electrical storm.

YACOLT, WASH.—The Amboy & Yacolt Telephone Co. has changed its name to the Southwest-Washington Telephone Co.

Underground.

PITTSBURGH, PA.—The Central District & Printing Telegraph Co. will spend approximately $80,000 in an underground system in this city.

SUPERIOR, WIS.—The Peoples' Telephone Co. has excavations in progress for an underground system.